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Voorwoord

Geachte collega's,
We zijn weer terug! Het orthopedische tijdschrift Wetenschap in Beweging gaat van start, net als heel de wereld een nieuwe start lijkt te maken in de periode na Corona. Het is even wennen: een nieuwe naam en een nieuwe layout, maar hetzelfde doel en voor dezelfde lezers. Net als onze herwonnen vrijheden ook even wennen zijn, zal het uiteindelijk hopelijk weer net zo vertrouwd voelen. Volop in beweging dus.
Ons tijdschrift is van een papieren editie overgegaan naar een digitale versie. Helaas heeft deze overgang meer tijd gekost dan aanvankelijk gedacht maar als we kijken naar het resultaat, mag dat er zijn. Natuurlijk ben ik bevooroordeeld en zijn suggesties uiteraard zeer welkom, maar ik denk dat de digitale versie van ons huistijdschrift nieuwe kansen geeft. Gebruikelijke rubrieken zijn gebleven, onderdelen zoals Verenigingsnieuws vindt (en vond) u in de email terug via NOViteiten en op de website. Nieuw is dat vanaf heden ook bewegend beeldmateriaal kan worden toegevoegd aan de publicatie.
Over bewegende beelden gesproken: deze zomer is de hele sport weer in beweging met EK's voor hockey en voetbal en naast de gebruikelijke Tour de France en Wimbledon is er ook nog de Olympische Spelen. Het kan niet op. Zeker nu ook de niet meer holle stadiongeluiden en blije supporters ook ons gemoed weer in beweging brengen. Het zal lastig worden om zelf in beweging te blijven met al deze geweldige evenementen op de televisie. De Coronakilo's moeten maar even wachten.
Mocht u toch in beweging willen komen: u kunt uw publicaties weer ouderwets in het Nederlands insturen naar publicaties@orthopeden.org.

Taco Gosens, *hoofdredacteur*

Inhoud

A giant synovial cyst in combination with the ‘congenital insensitivity to pain’ syndrome

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A 36-year old patient with congenital insensitivity to pain (CIP) syndrome, presented with severe swelling of the left thigh several weeks after a mild knee trauma. Radiological examination excluded a femoral fracture. CT and MRI identified multiple large cysts, which surrounded the proximal femur and extended to the ankle. Treatment consisted of surgical exploration and drainage followed by extensive microscopic and pathological examination. Based on both imaging and pathological analysis, a giant synovial cyst was diagnosed in this CIP patient. Because of the inability to feel pain or discomfort, CIP patients may show patient-delay. This case justifies the need for strict follow-up for CIP patients suffering from (mild) trauma, in order to detect complications in an early stage.

Introduction

The congenital insensitivity to pain (CIP) syndrome or hereditary sensory and autonomous neuropathy (HSAN), is a rare disease with an estimated incidence of 1 in 25.000.[1,2] CIP was first described in 1963 by Swanson.[3] CIP syndrome has an autosomal recessive inheritance pattern and is genetically and clinically heterogeneous. The disease is characterized by an inability to feel pain from any stimulus, including inflammation and heat, whether or not accompanied by autonomous disorders. Sensibility, vibration, sense of position, motor skills, and tendon reflexes are intact. As a result, a CIP patient is able to distinguish hot and cold, but lacks the ability to detect a (dangerously) hot object.[4,5]
Because of the inability to experience pain, a CIP patient may be less likely to consult a doctor. This could lead to patient-delay causing uncommon and extraordinary presentations, like in the case presented here.

Patient

The patient is a 36-year old female with Moroccan, born in the Netherlands and raised in a family of seven children (three girls and four boys). They all have the same parents, who were cousins. Besides CIP, no further family history was known. CIP was present in one additional sibling. The patient's medical history includes multiple fractures, including femoral- and hip fractures, resulting in a left resection arthroplasty (Girdlestone situation). In addition, the patient suffers from a Charcot foot, with failed arthrodesis based on recurrent infections.

Intervention

The patient presented with severe swelling of the left thigh several weeks after a mild trauma. She did not suffer from pain or any other complaints and was still able to bear weight on the affected leg. Physical examination showed an adequate female, with a body mass index (BMI) of 27.8, and blood pressure, pulse, and temperature within normal ranges. Inspection showed an evident swelling of the upper leg, mainly located in the left groin, in the genital area, and over the left buttock and upper thigh. No clear signs of knee-effusion were seen. Motor- and sensory functions were intact and symmetrical.
Conventional X-rays showed no fracture and no cranialization of the proximal femur in relation to previous examinations *(figure 1)*. Ultrasound of the swelling on the medial side of the thigh revealed multiple hypo-echoic inhomogeneous collections. The computed tomography (CT) showed the intramedullary pin fixation on the proximal side of the right femur and a Girdlestone of the left femur.

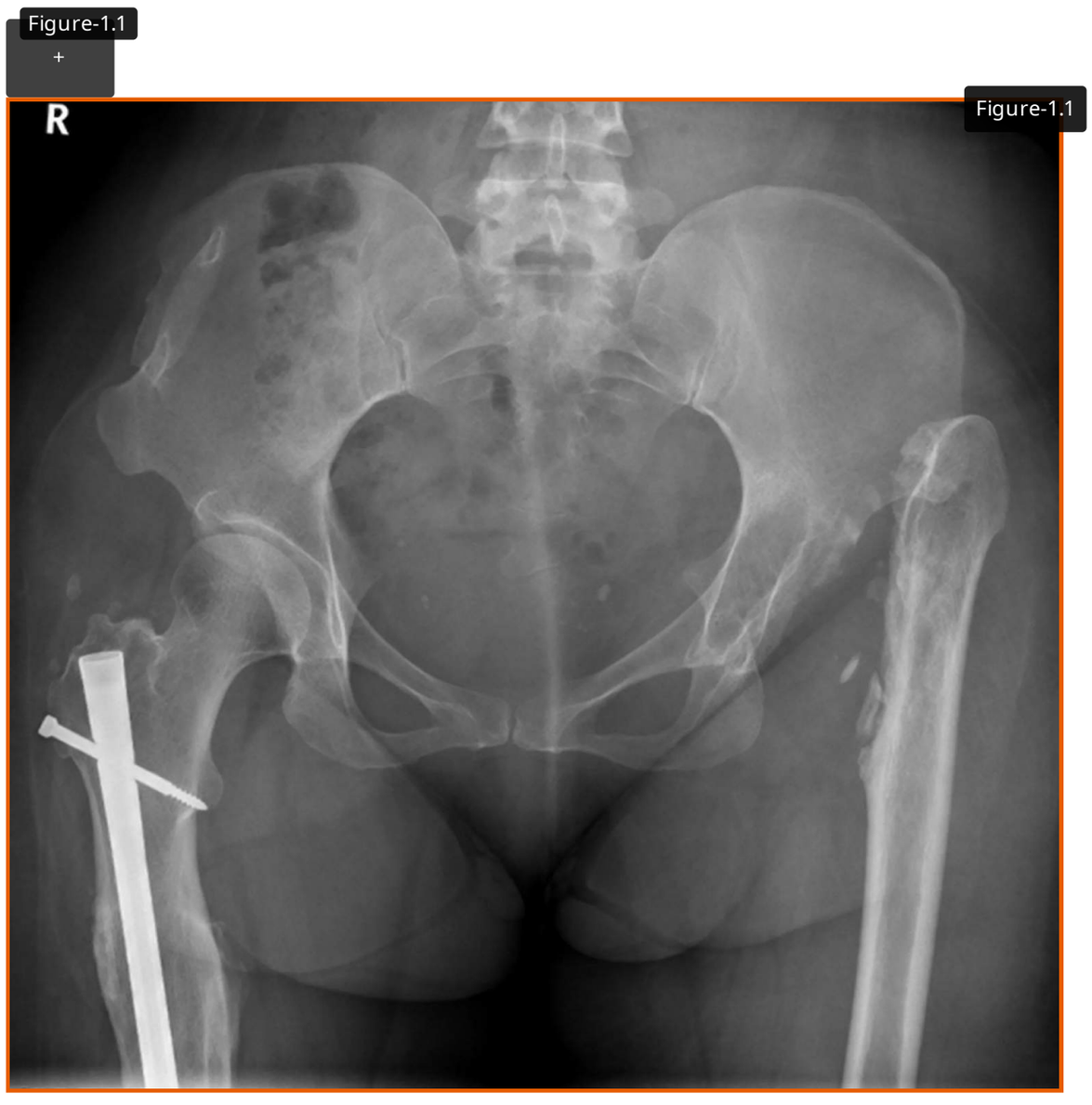

Figure 1. *AP X-ray of the pelvis and proximal femur showing a past resection arthroplasty (Girdlestone) of the left proximal femur and intramedullary pin fixation of the proximal right femur. There were no new fractures found and no cranialization of the proximal femur was seen compared to previous exams.*

Furthermore, multiple fluid collections with marginal colouring were seen in the left hip, gluteal region and thigh, with soft tissue induration surrounding the left hip *(figure 2a)*. Repeated Magnetic Resonance Imaging (MRI) with a three-week interval showed an increase in size of the lesions, with extension of the intermuscular fluid collection from the pelvis to the lower extremity. The second MRI showed two large cysts anteriorly and posteriorly in the gluteal region of 7.0 x 2.8 x 4.5 cm and 11 x 3.0 x 7.1 cm, respectively. The largest cyst was found in the hamstring region with the greatest dimensions of 20 x 6.4 x 3.6 cm, and an extension to the achilles tendon *(figure 2b)*.

Figure-2.a.1

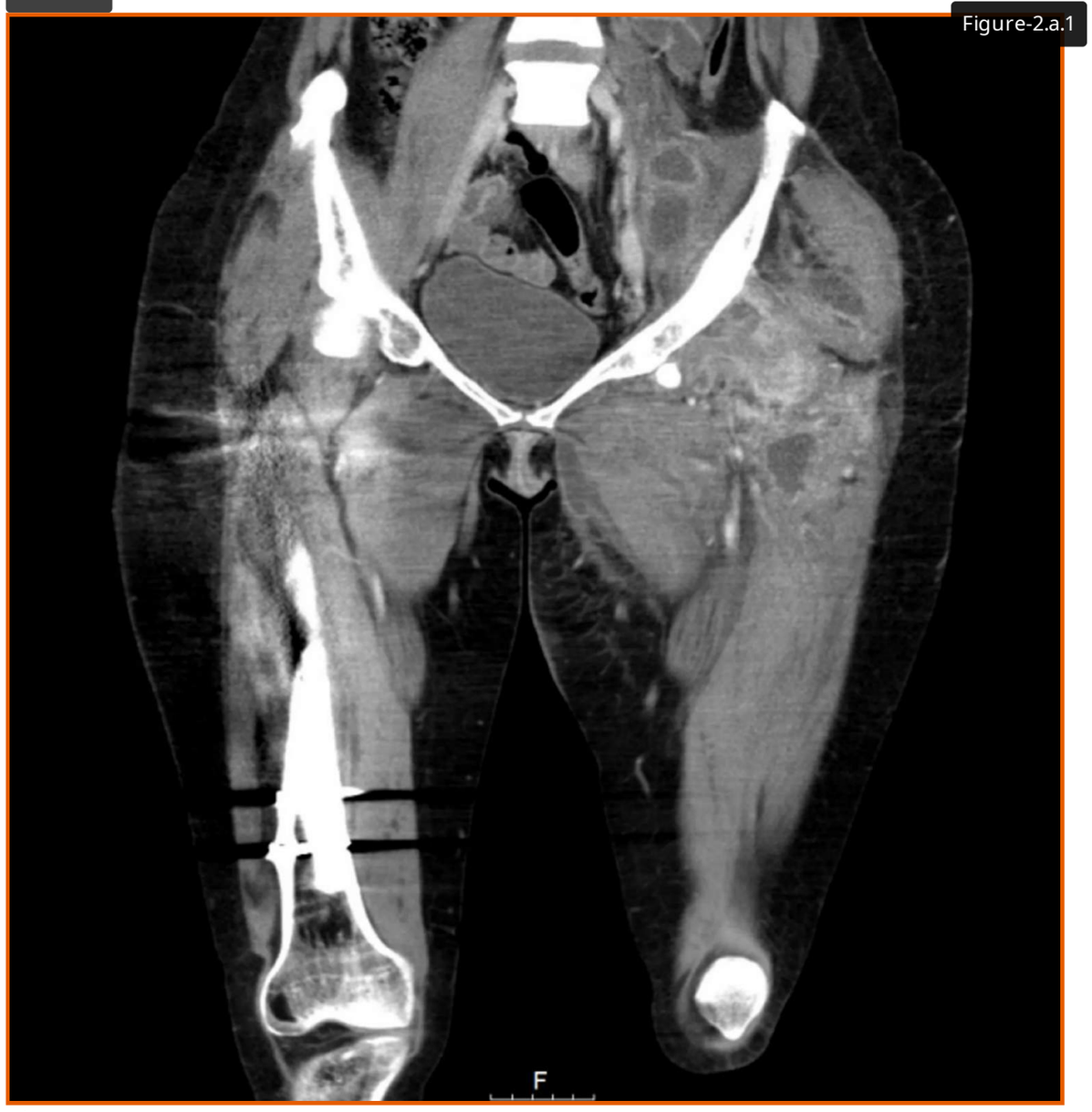

Figure 2.a

Figure-2.b.1

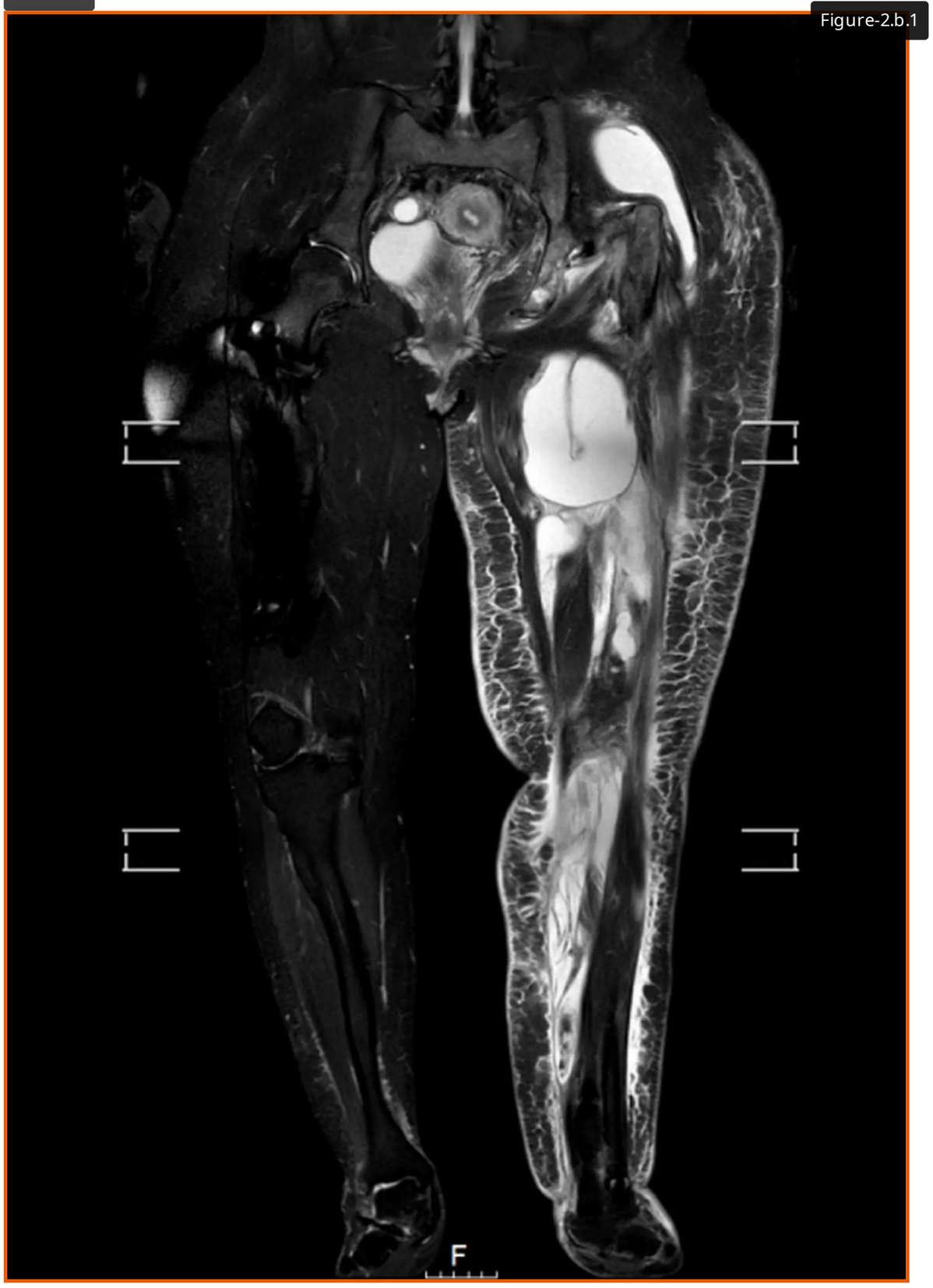

Figure 2.b

Figure 2a and 2b. *Coronal CT (figure 2a) and MRI (figure 2b) showing multiple fluid collections in the left hip and thigh with marginal colouring and induration in the soft tissue surrounding the hip. Arrows indicate the largest cysts seen on the MRI both gluteal and extending from the hamstrings to the ankle (figure 2b).*

Ultrasound and MRI were not indicative of a Morel Lavallee lesion as the giant cyst had an intermuscular and intercompartimental orientation and a normal relation between the skin, subcutaneous fatty tissue and the underlying fascia was seen. Laboratory tests showed a c-reactive protein (CRP) of 1 mg/L, an erythrocyte sedimentation rate (ESR) of 4 mm/hour, and a haemoglobin level of 7.7 mmol/L. The ultrasound guided aspiration of the fluid collections (450ml serosanguinolent fluid) were sent for pathological and microbiological assessment. Due to a further increase of the swelling within several days of admission, which now ranged from the thigh to the ankle, the patient underwent surgical exploration and drainage. Three drains were placed near the proximal femur and thigh. The patient was treated with broad-spectrum antibiotics (Cefacidal 4 x 1g intravenous). A pressure bandage was applied around the entire left leg. Culture assessment was conducted for pathogenic micro-organisms, yeasts and fungi, leukocyte counting, and crystals; all tests were negative. Pathological examination of the cyst tissue showed synovial tissue with reactive changes. Besides, avital bone was seen with some reactive changes and signs of inflammation, matching osteomyelitis.

Comparison

Since CIP syndrome is a rare disease, and a giant synovial cyst an uncommon diagnosis, it is difficult to compare the diagnostic and therapeutic modalities to literature. For detection of cystic lesions, MRI is superior to all other imaging modalities.[6,7] However, because MRI lacks the ability to detect subtle areas of matrix mineralization we chose to add a CT scan as a diagnostic modality. Since CT is able to detect subtle abnormalities, which may occur as a result of ossification or calcification, CT has additional value to MRI. The morphologic characteristics of these subtle areas of mineralization may aid in de diagnostic process of soft tissue masses.[7,8] Moreover, the use of 3D imaging with CT may allow a better understanding of the anatomic relationship between the soft tissue mass and adjacent neurovascular and osseous structures. This can be of considerable value in designing an optimal surgical approach.[8]

Outcome

During the first four days after surgery, the drains produced a total of 1680ml serosanguinolent fluid. The drains were removed after five days because of diminished production. Exudate from the wound was seen until day eleven post-surgery. Afterwards, no recurrence of swelling was seen. The patient was allowed partial weightbearing for three weeks. She returned for follow-up after 6 weeks, three- and nine months. At the final follow-up, the patient had no clinical symptoms of discomfort, the wound remained dry and no signs of recurrence were shown.

Comparing the literature

Cysts of the hip and knee can appear incidentally, but are usually accompanied by hip disorders such as trauma, avascular necrosis of the femoral head, osteoarthritis, rheumatoid arthritis, and total hip arthroplasty.[6,9,10] The preferred orientation of synovial cysts are around the knee where they often arise between the tendons of the medial head of the gastrocnemius and the semimembranosus muscles (Baker's cyst).[9] Commonly, these patients present with pain, discomfort, swelling in the popliteal space, and/or a decreased range of motion.[9,11] Symptoms that our patient was unable to experience. To the best of our knowledge, no 'giant' synovial cyst has been described previously that ranges from the pelvis to the ankle, whether or not in the CIP syndrome.

Recommendation

Patients with CIP syndrome are unable to experience pain, which can lead to patient-delays and unusual clinical presentations. Indeed, a strict follow up regime after trauma in CIP patients is warranted, to avoid complications at an early stage. A physician should be aware of an uncommon presentation in CIP patients and has to inform them about the risk of patient-delay. Furthermore, both CT and MRI, can play an important role in the diagnostic process of rare ('giant') cysts.

References

1. Kruyt M.C., Kruyt N.D., Oner F.C., Hanlo P.W., Verbout A.j. Congenitaal pijnongevoeligheidssyndroom; een zeldzame aanwijzing voor het nut van pijn. Ned Tijdschr Geneeskd. 2007;151:1527:32.
2. Algahtani H., Naseer M.I., Al-Qahtani M., Abdulrahman S.A., Boker F., Shirah B. Congenital insensitivity to pain with anhidrosis: a report of thow siblings with a novel mutation in (TrkA) NTRK1 gene in a Saudi family. J Neurol Sci. 2016;370:35-38.
3. Swanson A.G. Congenital insensitivity to pain with anhydrosis. A unique syndrome in two male siblings. Arch. Neurol., 1963;8:299-306.
4. Schon K., Parker A., Woods C.G. Congenital insensitivity to pain overview. GeneReviews. 2018.
5. Peddareddygari L.R., Oberoi K., Grewal R.P. Congenital insensitivity to pain: a case report and review of the literature. Case Rep Neurol Med. 2014. Article ID 141953, 4 pages.
6. Yukata K., Nakai S., Goto T., Ikeda Y., Shimaoka Y., Yamanaka I., et al. Cystic lesion around the hip joint. World J Orthop. 2015;6(9):688-704.
7. Mayerson J.L., Scharschmidt T.J., Lewis V.O., Morris C.D. Diagnosis and management of soft-tissue masses. J Am Acad Orthop Sur. 2015;64:95+.
8. Subhawong T.K., Fishman E.K., Swart J.E., Carrino J.A., Attar S., Fayad L.M. Soft-tissue masses and masslike conditions: what does CT add to diagnosis and management? AJR Am J Roentgenol. 2010;194(6):1559-67.
9. Shikhare S.N., See P.L.P., Chou H., Al-Riyami A.M., Peh W.C.G. Magnetic resonance imaging of cysts, cystlike lesions, and their mimickers around the knee joint. Can Assoc Radiol J. 2018;69:197-214.
10. McCarthy C.L., McNally E.G. The MRI appearance of cystic lesions around the knee. Skeletal Radiol. 2004;33:187-209.
11. Shah D.P., Diwakar M., Dargar N. Bakers cyst with synovial chondromatosis of knee – A rare case report. J Orthop Case Rep. 2016;6:17-19.

Inhoud

The effect of postponing joint replacement surgery due to COVID-19 on quality of life for patients suffering end-stage osteoarthritis

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Abstract

Purpose
To analyse the effect of postponing joint replacement surgery due to the coronavirus disease 2019 (COVID-19) pandemic on osteoarthritic (OA) pain, functional limitations and Quality of Life (QoL) in end-stage OA patients.

Methods
A survey-based cross-sectional study and repeated pre-operative standard Patient Reported Outcomes (PROs) in a general district hospital in the Netherlands. All patients planned for hip of knee replacement surgery which was cancelled after March 16th 2020 due to the COVID-19 pandemic (n=134) were asked to participate. The survey included questions on change of symptoms, analgesic medication use, complications and fear for COVID-19 when returning to the hospital. Patients who already completed their PROs before initial surgery was cancelled due to COVID-19 were asked to complete PROs again, in order to estimate disease burden.

Results
96 patients (71%) returned the survey of which 88 (66%) were included in the study. Symptoms improved in one patient (1.1%) 24 patients (27.3%) reported no change, 27 (30.7%) a mild increase and 36 (40.9%) a strong increase in OA symptoms. Mean QoL measured with the EQ5D deteriorated more in hip patients than in knee patients (-.17 versus -.03, p = 0.03). One patient suffered a gastrointestinal bleeding due to NSAID use. 14 Patients (15.9%) expressed fear for COVID-19 contamination if arthroplasty surgery was to be scheduled after the first lockdown.

Conclusion
OA complaints increased and QoL deteriorated in the vast majority of patients who had their hip or knee replacement surgery cancelled due to the COVID-19 pandemic.

Background

In March 2020 the COVID-19 pandemic spread fast throughout the Netherlands. During this pandemic, there was a sudden increase of critically ill patients in need of intensive care treatment. In order to prevent spread of COVID-19, public places like hospitals were closed and almost all medical resources were used for critically ill (COVID-19) patients. Their number almost exceeded the number of available ICU beds and nearly all Dutch hospitals were in danger of being overloaded. Almost all electively scheduled operations were cancelled from March 16th 2020 onwards.

One of the most important and successful procedures in orthopedic surgery is artificial joint replacement, most often related to hip or knee osteoarthritis (OA). In the Netherlands, every year approximately 77.000 joint replacement surgeries are performed and in our hospital annually 450 hips and 550 knees.1 Due to COVID-19, this type of surgery was postponed for many thousands of patients. By the end of May 2020 less COVID-19 patients were hospitalized, and usual hospital care was started again. The urge to resume oncologic and cardiologic care is obvious, due to life threatening consequences and great impact on Quality of Life (QoL) of involved pathologies.

Pathology within the field of orthopedic surgery mostly concerns quality of life, but is not related to life-threatening or life-lengthening indications for surgery. Therefore, the urge to resume orthopedic care seems less acute and restarting elective OA related arthroplasty after the first lock down progressed slowly. However, information on how profound orthopedic patients are affected when their joint replacement surgery is postponed is scarce. In this study, we present the effect of postponing joint replacement surgery in end-stage OA patients related to symptoms and quality of life during the first COVID-19 hospital lockdown in the first half of 2020.

Methods

We conducted a cross-sectional study in a single district hospital (St. Anna hospital, Geldrop). The study was reviewed and approved by the hospital Medical Ethical Committee. In our hospital, due to the COVID-19 pandemic all elective surgery was cancelled from March 16th 2020 onwards. A survey was sent (June 2020) to all patients who were planned for joint replacement surgery but who had their surgery postponed due to this first lockdown (n=134). This survey included questions on symptoms during their extended waiting period using a 4 point scale with the options:

1: symptoms improved during lockdown;
2: no change in symptoms;
3: mild increase;
4: strong increase in symptoms.

Any change in the use of analgesic medication and complications due to the extended waiting were also evaluated using open text fields. We also asked patients if they had any fear for COVID-19 if in time, they were allowed to come to the hospital for surgery. Standard Patient Reported Outcomes (PROs) were repeated if patients had completed these before their surgery was postponed. For patients scheduled for total hip replacement this included the Hip disability and Osteoarthritis Outcome Score – Physical function Short form (HOOS-PS, ranging from 0 (no difficulty) to 100 (extreme difficulty) and the Oxford Hip Score (OHS, ranging from 0 (worst) to 48 (best)). Patients scheduled for total knee replacement were asked to complete the Knee disability and Osteoarthritis Outcome Score – Physical function Short form (KOOS-PS, ranging from 0 (no difficulty) to 100 (extreme difficulty)) and the Oxford Knee Score (OKS, ranging from 0 (worst) to 48 (best)). Both hip and knee OA patients were also asked to complete the EuroQol five-dimension (EQ-5D-5L) questionnaire to measure Quality of Life and pain scores at rest and during activity using a Numeric Rating Scale (NRS, ranging from 0 (no pain) to 10 (worst pain)). For the Netherlands, the EQ-5D scores range from -.329 to 1, with a score of 1 representing full health and 0 representing death.[2] Negative EQ-5D index scores are possible and are noted as a 'Worse than Death (WTD) status, as described earlier by Scott et el.[3]

PRO results were compared to the Smallest Detectable Change (SDC) and the Minimal Important Difference (MID) both on group and individual level if available.4,5 All patients who gave written informed consent, completed the survey and did not yet have their postponed joint replacement surgery at the time of completing the survey were included. No protected health information was collected from any patient. Patients or the public were not involved in the design, or conduct, or reporting, or dissemination plans of our research. Descriptive statistics were used to report the outcomes.

Results

Response rate

The questionnaire was returned by 96 patients (71%). Of these 96, eight already received their joint replacement surgery by the time they received the survey and were excluded from analysis. In the remaining 88 (66%) patients, the average time that their surgery was postponed until they completed the survey was 10 weeks (min-max: 6.7-13.0). Compared to reference data from the Dutch Arthroplasty Register, the proportion of male patients was larger in our study group (51% versus 36%). The mean age was comparable to the reference group males (69.5 years versus 69.1 years).[6] See *table 1* for patient demographics.

Artikel-5-table-1

Artikel-5-table-1

Table 1, Patient demographics and results	All (n=88)	Hip (n=31)	Knee (n=57)
Male/Female (n)	45/43	15/16	30/27
Age (mean, min-max)	69.5 (51.2-87.8)	70.2 (56.0-85.6)	69.2 (51.2-87.8)

Change in symptoms

24 patients (27.3%) reported no change in symptoms, 27 (30.7%) reported a mild increase in symptoms and 36 (40.9%) reported a strong increase in symptoms. One patient (1.1%) noticed less symptoms. Extra pain medication use was reported by 38 (43.2%) patients and 15 patients (17%) contacted either their GP or our hospital to seek advice related to their increased symptoms. One patient received an intra-articular knee injection due to increased OA symptoms. 19 Patients (22%) developed pain in other joints during this period. Of all 88 included patients, 14 (15.9%) expressed COVID-19 related fear for entering the hospital after the lockdown.

PRO results

38 patients (43%) were initially scheduled for TKP and already completed PROs before their surgery was postponed. Sixteen patients completed PROs again for this study. In our group of patients scheduled for THP, 35 completed their PROs questionnaires before their surgery was postponed, 27 completed these PROs again for purpose of this study. Mean QoL deteriorated during the COVID-19 lockdown, but only for the patients awaiting hip replacement surgery than for patients awaiting knee replacement surgery (change in EQ-5D index score: -0.17 for THA versus +0.02 for TKA, p = 0.03). There were no patients with a WTD status (negative EQ-5D index score) before the COVID-19 lockdown, and one patient (waiting for hip replacement surgery) with a WTD status at the end of the lockdown (EQ-5D score -0.16). Pain at rest improved for the TKA patients, while the OHS score worsened significantly. All other PROs did not show any statistically significant change. *See table 2*.

Artikel-5-table-2

Artikel-5-table-2

Table 2, PRO results	Pre COVID-19 lockdown (n=73)	Re-start elective surgery (n=43)	p
Pain at rest, mean (SD)[1]			
All	5.5 (2.7)	5.2 (2.4)	0.46
THA	5.2 (2.5)	5.4 (2.6)	0.68
TKA	6.6 (1.8)	4.9 (2.1)	0.05
Pain during activity, mean (SD)[1]			
All	7.5 (2.1)	7.3 (2.2)	0.66
THA	6.1 (3.6)	7.3 (2.5)	0.81
TKA	7.9 (0.9)	7.2 (1.8)	0.13
EQ-5D index score, mean (SD)[2]			
All	0.64 (0.18)	0.47 (0.23)	0.00
THA	0.64 (0.17)	0.47 (0.24)	0.00
TKA	0.62 (0.23)	0.64 (0.19)	0.59
HOOS-PS/KOOS-PS, mean (SD)[3]			
THA	46.0 (18.1)	49.8 (20.7)	0.32
TKA	53.8 (11.9)	48.3 (12.7)	0.10
OHS/OKS, mean (SD)[4]			
THA	24.0 (8.7)	19.7 (9.7)	0.01
TKA	24.7 (6.1)	27.7 (8.3)	0.06

[1] measured using a NRS score, with 0 meaning “no pain at all” and 10 meaning “worst imaginable pain”;

[2] EQ-5D index score Dutch dataset ranging from -0.329 (worst possible health) to 1 (best possible health);

[3] KOOS-PS and KOOS-PS scores range from 0 (no difficulty) to 100 (extreme difficulty);

[4] OKS and OHS scores range from 0 (worst) to 48 (best)). SD = Standard deviation.

Discussion

QoL deteriorated more for the patients awaiting hip replacement surgery than for patients awaiting knee replacement surgery (EQ-5D index change score: - 0.17 versus -0.03). Almost halve (40.9%) of arthroplasty patients for who surgery was postponed due to COVID-19 reported a strong increase of their symptoms and almost a third (30.7%) experienced a mild worsening of their hip or knee symptoms, although this effect was less apparent in the standard PRO's. An EQ-5D index score of 1 represents full health and 0 represents death, but negative EQ-5D index scores are possible and reflects a 'Worse than Death (WTD) status.[2] In our study no patient had a WTD status while being scheduled for joint replacement surgery before the COVID-19 lockdown. At the end of the first lockdown, one patient scored a WTD status while waiting for hip replacement surgery.

In a recent study 19% of patients awaiting hip replacement and 12% awaiting knee replacement for degenerative joint disease reported to be in a WTD health state, as measured with the EuroQol five-dimension (EQ-5D) questionnaire.[3] This result signifies the impact of end stage osteoarthritis (OA) for patients awaiting joint replacement surgery, although this effect is less pronounced in our study population.

Our study is limited by the fact that not all patients completed PROs, possibly introducing selection bias. Strong points are a high response rate, and the inclusion of both hip and knee arthroplasty patients. Compared to patients included in the Dutch Arthroplasty Register, the study group included more males but the mean age was similar. [LROI REF] The pre-operative QoL scores for our patients were not as dramatic as found in the study by Scott et al[3], who investigated the proportion of the patients with a WTD status while waiting for joint replacement surgery in the United Kingdom. This might be explained by a different EQ-5D syntax for the United Kingdom, since in the United Kingdom value set one-third of the 243 possible health states are negative or WTD, compared to only 15% in the Netherlands.

Similar to our results, Scott et al. found that the majority (54%) of electively scheduled hip and knee arthroplasty patients suffered from increased OA pain during the COVID-19 pandemic.[3] This U.S. based study provided detailed information on financial and job security anxiety due to COVID-19 but less details on OA pain. In addition, we were also able to add standardised PRO results and complications during the COVID-19 lockdown.

Hoogeboom et al. systematically reviewed the effect of waiting lists on joint replacement surgery patients and, in contrast to our findings, reported that patients waiting for hip replacement had no change in pain or functional status and conflicting evidence for patients awaiting knee replacement surgery.[7] However, the patients in the study by Hoogeboom et al. faced long waiting times (>180 days), but their surgery was not cancelled and subsequently postponed, as was the case in our study.

Patients in our study predominantly showed worse outcome in almost all PROs and EQ5D. This might be caused by the fact that our patients were already at the end of their waiting time when their surgery was cancelled, and nonoperative care (e.g. moderate exercising and physiotherapy) were severely limited during the first COVID-19 lockdown in 2020. During the current (second) COVID-19 lockdown elective surgery is again cancelled for almost all joint replacement surgery patients. This time however, physiotherapy is still available which might mitigate the negative effects of postponing this type of surgery.

On the other hand, possibly some patients were not even rescheduled for their surgery when the second lockdown came into effect, or were rescheduled but cancelled again. One can imagine that the negative effects presented in this study are even more pronounced if surgery is postponed multiple times.

In conclusion, most patients who had their joint replacement surgery cancelled due to first COVID-19 lockdown experienced a deterioration in their QoL during this lockdown. With a simple questionnaire we were able to identify which patients reported no change, which patients reported mild worsening, and which patients reported severe worsening of their OA symptoms during the COVID-19 lockdown.

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Each author certifies that he or she has no commercial associations (eg, consultancies, stock ownership, equity interest, patent/licensing arrangements, etc) that might pose a conflict of interest in connection with the submitted article.

References

1. LROI report 2019. https://issuu.com/bladerboek/docs/lroi_magazine_2019. Date last accessed June 30th 2020.
2. Dolan P. Modeling valuations for EuroQol health states. Med Care 1997;35:1095-1108.
3. Scott CEH, MacDonald DJ, Howie CR. 'Worse than death' and waiting for a joint arthroplasty. Bone Joint J. 2019 Aug;101-B:941-50.
4. Beard DJ, Harris K, Dawson J, Doll H, Murray DW, Carr AJ et al. Meaningful changes for the Oxford hip and knee scores after joint replacement surgery. J Clin Epidemiol. 2015; 68(1): 73-9.
5. McClure NS, Al Sayah F, Xie F, Luo N, Johnson JA. Instrument-Defined Estimates of the Minimally Important Difference for EQ-5D-5L Index Scores. Value Health 2017;20:644-50.
6. https://www.lroi-report.nl/hip/total-hip-arthroplasty/demographics/. Date last accessed 26th January 2021
7. Hoogeboom TJ, van den Ende CHM. van der Sluis G, Elings J, Dronkers JJ, Aiken AB et al. The impact of waiting for total joint replacement on pain and functional status: a systematic review. Osteo Cart 2009; 17(11): 1420-7.

Inhoud

Treatment for first-time patellar dislocations in the Netherlands; a wide variety of strategies

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Abstract

Introduction

Patellar dislocations are a common problem in the casualty department (5.8 to 42 persons per 100.000 per year). In the Netherlands, a conservative treatment is usually chosen after a first-time patellar dislocation, although there is no consensus of what this conservative treatment should entail. The aim of this study was to assess the different treatment strategies used for first-time patellar dislocations in the Netherlands.

Material and methods

An online questionnaire was sent to physicians of the emergency, surgical and orthopaedic departments of 71 general and academic hospitals in the Netherlands. The questionnaire assessed the preferred treatment strategy used in primary patellar dislocations, duration of treatment and clinical evaluation of patients.

Results

A total of 147 responses were acquired (response rate 49%), of which 98% agreed on an initial conservative treatment in a first-time patellar dislocation. A posterior splint was used by 53 physicians (36%), a brace by 50 (34%) and a cast by 28 of the respondents (19%). Half of the respondents (n=73, 50%) treated patients for a duration of 6 weeks, 18 (12%) of the respondents for 4 weeks and 24 (16%) for 2 weeks.

Conclusion

In the Netherlands, treatment of a first patellar dislocation differs greatly between hospitals and physicians. Most physicians agree on a conservative treatment, although the treatment strategy and duration of treatment differs strongly. Further research is required to gain more evidence and to uniformise protocols in treatment after a first-time patellar dislocation.

Introduction

Patellar dislocation is a serious problem with approximately 5.8 to 42 persons per 100.000 per year suffering from a patellar dislocation.[1-4] Therefore, patellar dislocations are a common problem in the casualty department.[2] It mainly affects young and active adolescents.[2,4] Common trauma mechanisms include flexion of the knee in the valgus position or a direct trauma on the patella.[5] Known risk factors for a patellar dislocation are: female gender, patella alta, trochlear dysplasia and an excessive tibial tuberosity-trochlear groove (TT-TG) distance.[2,6] In the majority of patellar dislocations, the medial patellofemoral ligament (MPFL) is torn[7] and the cartilage in the knee is damaged (95%).[8]

The first step of treatment after dislocation is reduction of the patella to its normal position. After reduction, X-rays, including a skyline view of the injured knee, are usually obtained to assess if there are any loose bony fragments or other associated injuries to the joint.[7,9]
There is a broad choice of treatment strategies following reduction, which can be divided into direct surgical intervention or a non-surgical treatment. Surgical intervention consists of MPFL reconstruction or patellar realignment procedures[10] Non-surgical intervention consists of (partial) immobilisation of the knee by restriction of flexion in the knee or functional mobilisation. Restricted flexion gives the MPFL the opportunity to heal. This can be achieved using either a posterior splint, a cast or a flexion-limiting brace.[11-13] If functional mobilization is selected, the knee is often supported using elastic bandages,[14] a brace with full range of motion or taping of the knee.[10,12]

After conservative treatment the redislocation rate, of first-time patellar dislocations is high at 17-44%[2,13,15] and patients frequently experience persistent pain and instability in the knee (63%).[14] Aside of the high redislocation risk, a period of immobilisation can induce atrophy and restriction in the range of motion.14 In the currently available literature, a wide variety of treatment strategies for first-time patellar dislocations are described. However, there is no consensus on the optimal treatment of first-time patellar dislocations and literature lacks studies of sufficient quality.[14,16,17]
The aim of this study was to assess the different treatment strategies for first-time patellar dislocations used in the Netherlands. In Dutch guidelines, the first choice of treatment fora first-time patellar dislocation is conservative if no concomitant osteochondral fractures are present.[18] Therefore, this study will focus on conservative treatment options.

Methods

An online questionnaire was developed in Google Forms®. The questionnaire is shown in appendix A.
The invitation to complete this questionnaire was sent to 71 general and academic hospitals in the Netherlands with an emergency department. All physicians involved in the treatment of first-time patellar dislocations; including trauma surgeons, orthopaedic surgeons and casualty physicians; were invited. Attending physicians, residents in training, residents not in training and physician assistants were asked to fill in the questionnaire.
The main purpose of the questionnaire was to assess the preferred treatment strategy used by their department in primary patellar dislocations; surgical or conservative; and if conservative, if either immobilisation by cast or a splint, functional mobilisation using a brace, tape or bandages or a combination of these techniques was used.
Other questions concerned whether there is a standard treatment protocol in the hospital, the type of imaging routinely performed and which physical examination is performed.
Data was collected in Google Forms® and further analysed using Excel (Microsoft Office Standard 2010).

Results

The online questionnaire was open for response from April to September 2017.
A total of 147 responses were received . A response was obtained from 35 of the 71 approached hospitals (49.3%) *(fig 1)*. Of the respondents, 71% worked as an attending physician, 16% as a resident in training, 12% as a resident not in training and 2% as a physician assistant.

Treatment strategies

Of the respondents, 98% agreed on initial conservative treatment in a first-time patellar dislocation case. The remaining 2% also favoured conservative treatment, although they let the choice of treatment depend on concomitant injuries such as avulsion fractures. A posterior splint was the treatment of choice for 53 physicians (36%). A brace was the preferred treatment method for 50 (34%) and a cast for 28 of the respondents (19%). 7 respondents treated patients by a short (1 to 2 weeks) immobilisation using a splint or cast first followed by controlled mobilisation using a brace or tape. 2 respondents prescribed physiotherapy as the primary choice of treatment. 1 respondent only used mobilisation with tape as primary treatment. 7 respondents indicated that they used multiple treatments in patellar dislocation *(fig 2)*. In 76% of the hospitals a standard treatment protocol was present; although only in 1 of the 35 hospitals all responding physicians did follow the treatment as proposed in the protocol.

fig1-3

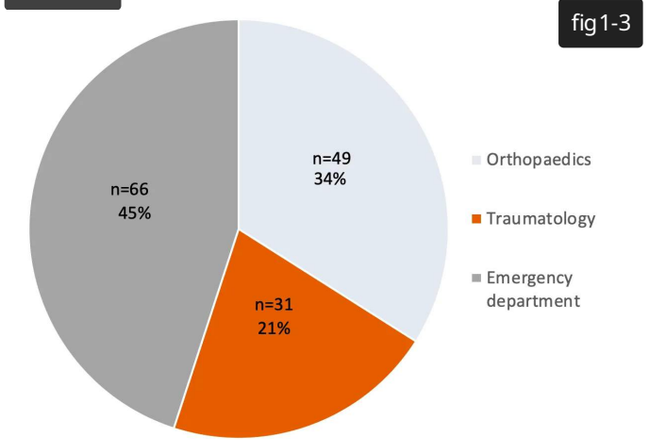

Figure 1. Distribution of the departments of the respondents

Fig-2-3

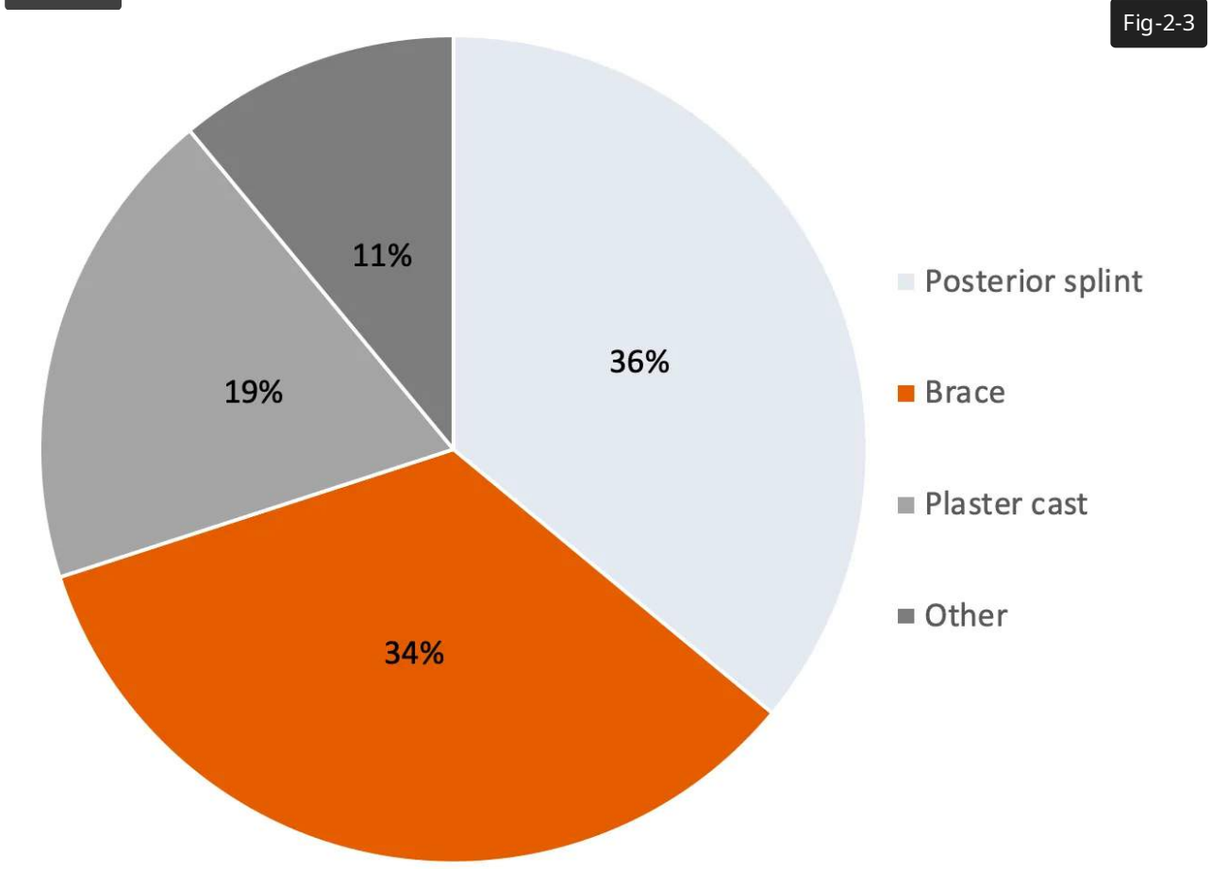

Figure 2. The variation in first-time patellar dislocation treatment across the respondents

Duration of treatment
Half of the respondents (n=73, 50%) treated patients for a duration of 6 weeks. 18 (12%) of the respondents continued treatment for 4 weeks, 2 (1%) for 3 weeks, 24 (16%) for 2 weeks and 2 (1%) for 1 week. 2 (1%) had an initial treatment for longer than 6 weeks and 26 (18%) were unfamiliar with the duration of treatment as they merely worked in casualty and did not perform the follow-up of patients at the outpatient clinic *(fig 3)*.

Imaging
An X-ray of the knee after a patellar dislocation was routinely performed by 123 respondents (84%). The indication for more extensive imaging such as a computed tomography scan (CT-scan) or magnetic resonance imaging (MRI-scan) varied enormously across the respondents. An additional scan was performed by 73 respondents based on the result of the X-ray, by 15 respondents based on physical examination and by 39 respondents based on the mechanism of the trauma. When complaints persisted, 8 respondents ordered an additional scan and 13 when recurrence of patellar dislocation occured. 4 respondents always performed a scan after a first-time patellar dislocation and 18 respondents replied that they never perform further imaging.

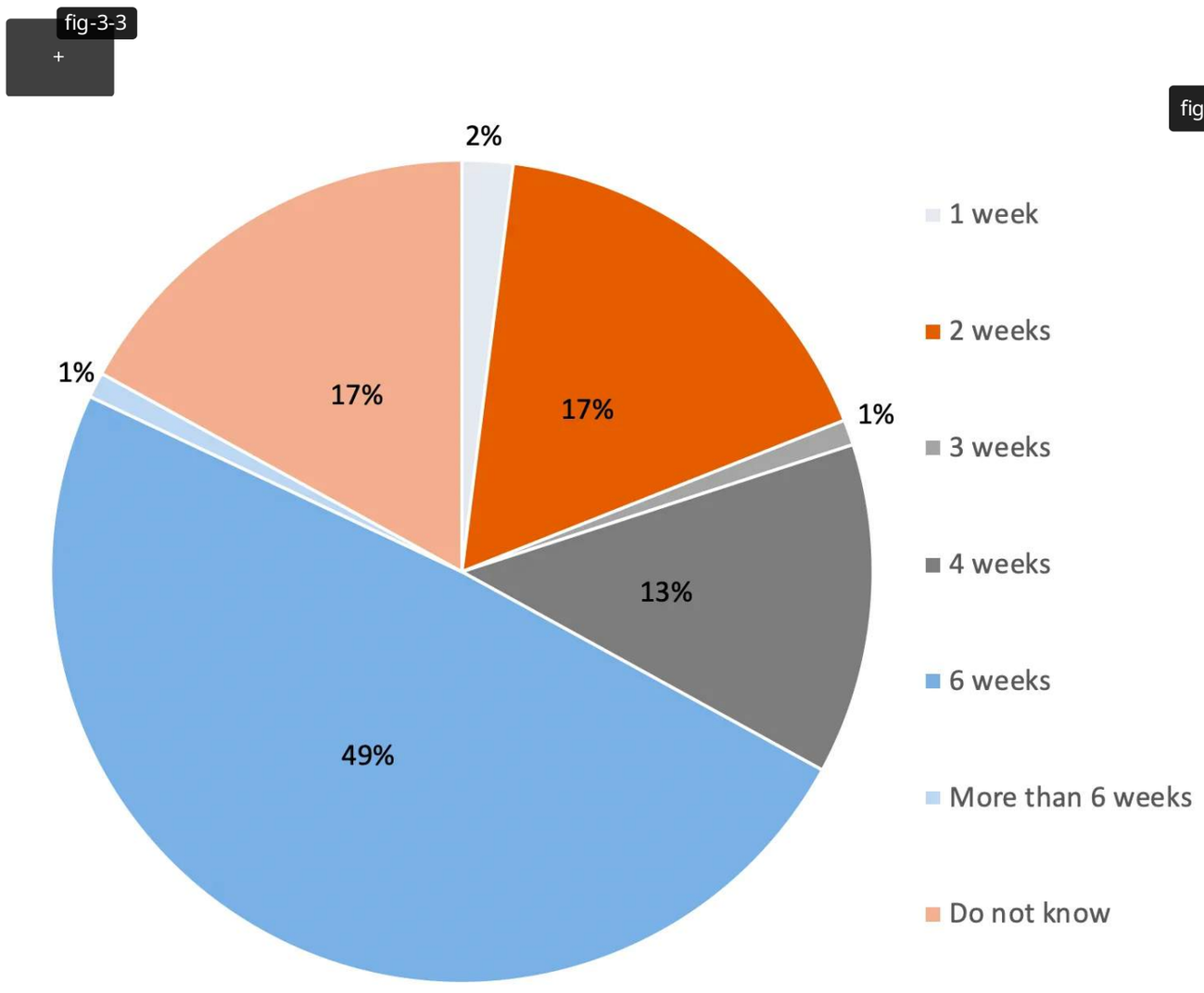

Figure 3. Duration of treatment as responded

Discussion

There are many treatment strategies described for first-time patellar dislocations ,including a brace, plaster cast, tape or surgical intervention. In the current literature, no consensus is reached on which of these treatments should be chosen to decrease pain and instability after treatment and to reduce the risk of redislocation.[14,16,17] Assessments of clinical imaging and different treatment strategies used in the Netherlands can help to develop a more standardised protocol how to assess and treat first-time patellar dislocations.

In this study we questioned physicians in the Netherlands how they treat first-time patellar dislocations. Results show that the treatment strategies differ greatly between Dutch hospitals and between treating physicians. If there are no fractures or concomitant injuries, an unanimous preference for conservative treatment exists with a roughly even distribution between immobilisation through a brace or posterior splint. A minority treats patients with a plaster cast.

Of the respondents, 76% indicated that the hospital had a protocol which prescribed how to treat first-time patellar dislocations. What was striking, was that, despite the presence of a protocol, different treatments were carried out in 20 out of 23 hospitals who had multiple respondents. This may be caused by the weak availability of evidence in literature, causing ambiguity which treatment is best, which leads to physicians choosing the best treatment based on their own experience. Another cause could be that the physicians are not familiair with the treatment prescribed in the local protocol or the protocol being outdated.
Additionally, the variation in the imaging performed after the dislocation is noticeable. Some respondents did not perform a standard X-ray after reduction, whilst other respondents always performed an X-ray and an additional scan in patients with a first-time patellar dislocation. Luhmann et al. described the findings of arthroscopy in all patients being surgically treated after a patellar dislocation. X-ray results showed that 27% of patients had an avulsion fracture of the lateral patella, 2% had a patellar fracture and in 1 patient an osteochondral defect was seen. Arthroscopy showed osteochondral defects in 73%, 15% of patients had a loose body and 10% a meniscal tear.[19] To avoid missing these injuries , an X-ray should be performed in every patient and an additional scan should be performed if there is a suspicion of concomitant injuries. Duerr et al. conclude in their review that in every patient an anteroposterior and lateral X-ray should be made. They advise an additional CT-scan to detect abnormalities in the osseous anatomy and a MRI to diagnose tears in soft tissues such as ligaments or osteochondral lesions.[9]

In the literature, only 1 other study examining the application of the different treatment strategies was found, although concerning physiotherapists. Smith et al describe the treatment by physiotherapists of a first-time patellar dislocation, showing that most of this group treats their patients with exercises (74% quadriceps exercises and 64% vastus medialis oblique (VMO) specific exercises). What was triking was that most of these therapists did not always apply the same treatment to every patient. Casts or posterior splints were never applied and most physiotherapists applied a brace in less than 24% of the patients or never after a first-time patellar dislocation. Different taping techniques were used, although also in the minority of patients.[20]

A few studies have been published that compare the outcomes of the several conservative treatments. Maenpaa et al. compared 3 groups, one group treated with a plaster cast, the 2nd with a posterior splint, and the 3rd group treated with a patellar bandage or a brace. They found a higher recurrence rate when patellar bandages and braces were used compared to a plaster cast and posterior splint in a total of 100 patients. No other significant differences were found.[14] Kaewkongnok et al. compared treatment with a brace for a duration of 2, 4 and 6 weeks and treatment with a brace followed by bandaging in a group of 1366 patients. The duration of the treatment with a brace did not significantly change the redislocation rate.[15] Armstrong et al. performed a feasibility study for a randomised controlled trial comparing 5 weeks immobilisation with a cylinder cast with mobilisation after 1 week of immobilisation in 6 patients. They did not find significant differences in pain, the Lysholm Knee score and disability at the follow-up after 3 months[12] Only Maenpaa et al. found a significant difference in outcomes between the conservative treatment strategies; the level of evidence in the best treatment strategy in first-time patella dislocation is very low.[14]

The main limitation of the current study is the low response rate of 49.3%. A higher response rate would have improved the reliability and generalisability of this study.
What may have influenced the results is that 45% of the responding physicians worked in the casualty department. In the Netherlands, these physicians treat most of the patients seen in casualty and consult other specialities if necessary. They only initiate treatment for the first week or weeks, after which follow-up is performed by an orthopaedic surgeon, trauma surgeon or resident. This may have influenced different outcomes;for example, the assessed information about the duration of treatment and indication for further imaging.

This study shows a wide variation in the clinical assessment and treatment of first-time patellar dislocations in the Netherlands. A nationwide protocol or guideline could help to improve outcomes and decrease redislocation rates. However, literature does not provide sufficient evidence to develop such a protocol. A retrospective study, comparing the outcomes of different conservative treatment modalities, followed by a prospective study or randomised controlled trial, could provide the evidence required to make a recommendation for clinical practice.

To uniformise treatment, sufficient, high quality research is required whether a knee should be immobilised, what theduration of immobilisation should be, or if quick functional mobilisationis indicated after a first-time patellar dislocation. If there is sufficient, high quality evidence on this subject, protocols can be adjusted and physicians can be stimulated to follow their protocols to improve the results of non-operative treatment of first-time patellar dislocation.

Conclusion

In the Netherlands, treatment of a first patellar dislocation differs greatly between hospitals and physicians. Most physicians agree on a conservative treatment, however about a third prescribe a cylinder cast for a few weeks, others treat their patients with a brace or posterior splint. Also, duration of treatment varies from 2 to 6 weeks. Further research is required to gain more evidence and to uniformise protocols for treatment after a first-time patellar dislocation.

Disclosure Statement

The authors do not have any conflicts of interest to declare.

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References

1. Sanders TL, Pareek A, Hewett TE, Stuart MJ, Dahm DL, Krych AJ. Incidence of first-time lateral patellar dislocation: A 21-year population-based study. Sports Health; 2018;10(2):146-151.
2. Fithian DC, Paxton EW, Stone ML, Silva P, Davis DK, Elias DA et al. Epidemiology and natural history of acute patellar dislocation. Am J Sports Med. 2004;32(5):1114-1121.
3. Atkin DM, Fithian DC, Marangi KS, Stone ML, Dobson BE, Mendelsohn C. Characteristics of patients with primary acute lateral patellar dislocation and their recovery within the first 6 months of injury. Am J Sports Med. 2000;28(4):472-479.
4. Gravesen KS, Kallemose T, Blond L, Troelsen A, Barfod KW. High incidence of acute and recurrent patellar dislocations: A retrospective nationwide epidemiological study involving 24.154 primary dislocations. Knee Surg Sports Traumatol Arthrosc. 2018;26(4):1204-1209.
5. Sillanpaa P, Mattila VM, Iivonen T, Visuri T, Pihlajamaki H. Incidence and risk factors of acute traumatic primary patellar dislocation. Med Sci Sports Exerc. 2008;40(4):606-611.
6. Dejour H, Walch G, Nove-Josserand L, Guier C. Factors of patellar instability: An anatomic radiographic study. Knee Surg Sports Traumatol Arthrosc. 1994;2(1):19-26.
7. Lattermann C, Arendt EA, Andrish J, Jones M. Extensor mechanism injuries. Comprehensive Orthopaedic Review, Second edition. Rosemont: AAOS, 2014.
8. Nomura E, Inoue M, Kurimura M. Chondral and osteochondral injuries associated with acute patellar dislocation. Arthroscopy. 2003;19(7):717-721.
9. Duerr RA, Chauhan A, Frank DA, DeMeo PJ, Akhavan S. An algorithm for diagnosing and treating primary and recurrent patellar instability. JBJS Rev. 2016;4(9).
10. Smith TO, Donell S, Song F, Hing CB. Surgical versus non-surgical interventions for treating patellar dislocation. Cochrane Database Syst Rev. 2015;2. doi(2):CD008106.
11. Smith TO, Davies L, Chester R, Clark A, Donell ST. Clinical outcomes of rehabilitation for patients following lateral patellar dislocation: A systematic review. Physiotherapy. 2010;96(4):269-281.
12. Armstrong BM, Hall M, Crawfurd E, Smith TO. A feasibility study for a pragmatic randomised controlled trial comparing cast immobilisation versus no immobilisation for patients following first-time patellar dislocation. Knee. 2012;19(5):696-702.
13. Longo UG, Ciuffreda M, Locher J, Berton A, Salvatore G, Denaro V. Treatment of primary acute patellar dislocation: Systematic review and quantitative synthesis of the literature. Clin J Sport Med. 2017;27(6):511-523.
14. Maenpaa H, Lehto MU. Patellar dislocation. the long-term results of nonoperative management in 100 patients. Am J Sports Med. 1997;25(2):213-217.
15. Kaewkongnok B, Bovling A, Milandt N, Mollenborg C, Viberg B, Blond L. Does different duration of non-operative immobilization have an effect on the redislocation rate of primary patellar dislocation? A retrospective multicenter cohort study. Knee. 2018;25(1):51-58.
16. van Gemert JP, de Vree LM, Hessels RA, Gaakeer MI. Patellar dislocation: Cylinder cast, splint or brace? an evidence-based review of the literature. Int J Emerg Med. 2012;5(1):45-1380-5-45.
17. Vermeulen D, van der Valk MR, Kaas L. Plaster, splint, brace, tape or functional mobilization after first-time patellar dislocation: What's the evidence? EFORT Open Rev. 2019;4(3):110-114.
18. Schipper I, van der Meulen H, Rhemrev S, et al. Richtlijnen voor behandeling van letsels van het steun- en bewegingsapparaat. 2016:197-198
19. Luhmann SJ, Schoenecker PL, Dobbs MB, Gordon JE. Arthroscopic findings at the time of patellar realignment surgery in adolescents. J Pediatr Orthop. 2007;27(5):493-498.
20. Smith TO, Chester R, Clark A, Donell ST, Stephenson R. A national survey of the physiotherapy management of patients following first-time patellar dislocation. Physiotherapy. 2011;97(4):327-338.

Inhoud

Supracondylar humerus fractures: should we avoid surgery during after-hours?

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Abstract

Background: Pediatric supracondylar humerus fractures occur frequently, composing 15% of all pediatric fractures. These fractures often require surgical reduction and fixation. Circumstances during after-hours can differ from those during office hours. Often, the decision has to be made whether to operate immediately, even during after-hours, or to wait until office hours.

Methods: Using the PICO strategy and Pubmed, we found three articles that compared the results of office hours and after-hours surgery for supracondylar humerus fractures. We assessed the outcomes of both groups in these studies, including successful reduction, function and complications.

Results: One of the three articles found a significant difference in poor fixation rate in favour of office hours, compared to after-hours. Another article found more malunions in the "night" subgroup versus the "all groups but night" group. The third article did not find any significant outcomes. And overall, no other differences were reported for complications, functional outcome and operation time in any of the articles.

Conclusion: No strong risks or benefits from either surgical reduction during office hours versus after-hours were found. Therefore, performing reduction after-hours appears to be generally safe. It can be advised to postpone surgery to office hours if circumstances are not optimal for acute surgery (e.g. no dedicated surgeon available), and if there is no medical contraindication.

Introduction

Supracondylar humerus fractures account for 15% of all childhood fractures. The incidence decreases sharply after the age of 10 due to skeletal maturation, and after the age of sixteen, this fracture is very rare.[1] The classic trauma mechanism is a fall on the outstretched arm, resulting in an extension type fracture, which accounts for 97% of supracondylar humerus fractures.[2] A significant portion of these children need surgical reduction and fixation. However, there is increasing debate on whether or not to operate these injuries after-hours.

The main indications for acute reduction are traumatic neurovascular injury, complicated fractures and significant fracture dislocation.[3] Acute neurovascular injuries are reported in 17% of patients with a dislocated supracondylar humerus fracture.[4] Dislocation is reported in 54% and is often characterized with the Gartland classification, Gartland I being a fracture without dislocation, which can be generally treated conservatively. Gartland type II indicates partial dislocation, which more often requires reduction with or without fixation. Type III and IV indicate complete dislocation, where type IV also has periosteal disruption.[5] These types III and IV fractures are often associated with anterior interosseous nerve neuropraxia, brachial artery disruption, and other complications.[1] Both usually require closed or open reduction and fixation. Fixation is generally performed with multiple K-wire fixation.[6]

Supracondylar humerus fractures are often managed on the day of admission, which can result in after-hours surgery.[6] It is assumed that after-hours surgery provides additional risks for patients, mainly due to surgeon fatigue and the lack of a specialized team, which is also illustrated in some recent literature on orthopaedic trauma, as higher complication and mortality rates have been reported for orthopaedic trauma surgery performed during after-hours.[7, 8] However, evidence for these alleged additional risks of after-hours procedures remains limited. For example, the hip fracture population has been investigated extensively on after-hours surgery. For these types of fractures, no significant differences have been reported between results of office hours and after-hours surgery.[8] But these result cannot simply be extrapolated to the supracondylar humerus fracture patient group. Because of the lack of consensus on this subject of after-hours surgery on supracondylar humerus fractures, this article will investigate the following question: **"Is it necessary and safe to perform surgery for paediatric supracondylar humerus fractures during after-hours?"**

Methods

Design

A PICO-strategy was used,[9] with the following research question: in children under 18 years old with a supracondylar humerus fracture (P) does after-hours surgery (I), compared to surgery during office hours (C) result in clinically different outcomes in follow-up, in terms of successful reduction, function and complications (O)?

A search strategy was built in collaboration with a librarian (J.W. Schoones). This strategy was used for PubMed, Web of Science, Embase and Cochrane, to find all relevant articles, written in English and published in the past 10 years. (Addendum 1: Search strategy). All references of the articles identified were also evaluated for relevant articles.

Results

The search strategy yielded sixteen articles on August 28th 2018. After screening of the titles and abstracts by one person (ST), five relevant articles were identified. Three of these could be included, with the other two having primary outcomes other than outcomes in follow-up. The quality of the three articles included was assessed as sufficient for inclusion using the PRISMA criteria (Addendum 2).

All three included articles retrospectively compared postoperative outcomes of patients who had surgery at different times of the day. Primary outcomes in the three studies were poor fixation rate (Aydogmus et al.)[7], malunion (Paci et al.)[10], and loss of reduction (Balakumar et al.)[11]. Furthermore, Aydogmus et al[.7] and Paci et al.[10] assessed functional outcome in follow-up. Other reported secondary outcomes were the length of hospital stay, duration of surgery, rate of open reductions, and complications.

table-1-article-4

Table 1. Outcomes and results of the articles included.

	Amount of patients in office hours group	Amount of patients in after-hours group	Primary outcome	Secondary outcomes	Primary result	Sec
Aydogmus et al.[7] 2017	47	44	poor fixation	surgical method, placement of any medial pins, operation time, any postoperative neurovascular complication, successful reduction rate, successful fixation rate, any induced deformity, and rate of loss of function	Significantly more poor fixation in the after-hours group vs the office hours-group (4/47 (9%) vs 17/44 (39%) (p=0.005))	No significant differences between any of the groups
Paci et al.[10] 2018	77	186	malunion	surgeon subspecialty, operative duration, range of motion, carrying angle, and other clinical outcomes.	No significant difference in malunion, but more in the "night" subgroup vs the "all groups but night" group (2/26 (8%) vs 2/236, 1%) (p=0.05))	No significant differences between any of the groups
Balakumar et al.[11] 2012	37	40	loss of reduction	number of pins used, and technical quality of pinning	No significant difference in loss of reduction in the office hours group vs the after-hours group (7/37, (19%) vs 7/40, (18%) p=1.00)	No significant differences between any of the groups

Aydoğmus et al.[7] compared a group of 91 children (age 0-11) diagnosed with a Gartland III fracture without neurovascular injury in the period of January 2012 to October 2014. Of the 91 patients, 47 were operated during office hours (8:00-17:00), and 44 during after-hours (17:00-8:00). Surgical technique was chosen by the treating surgeon. Follow-up was weekly in the first month, followed by follow-up every three months for at least one year.
"Poor fixation", as the primary outcome, was defined as pins crossing the fracture line, pins not placed bicortically and/or pins for which the entry points were very close to each other. A significant difference in poor fixation was found between the groups: 4/47 patients (9%) in the office hours group had a poor fixation, compared to 17/44 (39%) in the after-hours group (p=0.005). The authors stated that a lack of sleep is often present when performing reduction at night, which might lead to a higher "poor fixation" rate. For the secondary outcomes, including surgical method, placement of any medial pins, operation time, neurovascular complications, successful reduction rate, successful fixation rate, range of motion, waiting time for reduction and any induced deformity, no differences were found. No reoperations were performed for any of the patients during follow-up. The authors concluded that reduction should be performed during office hours, instead of after-hours, by adequately rested surgical staff.

Paci et al.[10] included 263 patients with a uncomplicated Gartland type II, III or IV fracture diagnosed in the period of August 1, 2002 to July 31, 2014. 263 patients with an average age of 5 years were included. 77 (29%) were reduced during office hours, which was defined as 6:00–16:00 from Monday to Friday. This group was compared with 186 (71%) reductions during after-hours, which was divided into evening (16:00-23:00), night (23:00-6:00) and weekend (Saturdays and Sundays, 6:00-16:00).
The primary outcome was the rate of malunion, defined as a clinically significant deformity, resulting in a change in treatment or follow-up plan. Secondary outcomes included operative duration, range of motion, carrying angle, and functional flexion and extension. Functional flexion was defined as flexion ≥130 degrees, and functional extension as ≤30 degrees. A normal carrying angle was defined as 0–19 degrees of elbow valgus. On final follow-up X-rays , the Baumann angles were measured and considered normal when between 64 and 81 degrees.
No significant differences were found in the primary and secondary outcomes after an average follow-up of 135 days. The authors reported no malunions among 77 cases in the office hours group, versus 4 malunions out of 186 (2.3%) in the after-hours group (p=0.3). However, when comparing all groups to the "night" subgroup, a borderline significant difference was found for malunion: 2/236 (0.9%) malunion in the "all groups but night" group, compared to 2/23 (9%) in the "night" group (p=0.05). This outcome might be at least partially associated with the fact that there were significantly more Gartland III/IV fractures in the after-hours group (selection bias): 129/186 (57%) in the office hours group, vs. 40/77 (73%) in the after-hours group (p=0.01). Furthermore, the authors found that it was more likely to have reduction performed by a fellow during after-hours compared to office hours 95/186 (49%) vs. 72/77 (93%, p<0.001). Therefore, the authors concluded that late night reduction performed between 23:00 and 05:59 may be associated with a higher rate of malunion, relating it to fatigue of the surgeon, variation in training and practice patterns of the operating surgeon, and experience of supporting staff.
Regarding secondary outcomes, the authors reported 55/55 (100%) functional extension in the office hours group, versus 126/128 (98%) in the after-hours group (p=1.00), and 39/77 functional flexion in the office hours group (68%), versus 91/186 (72%) in the after-hours group (p=0.6).
Based on these findings, the authors caution surgeons against operating during late night hours without urgent indication. If these late night hours are avoided, surgical treatment is assessed as generally safe.

Balakumar et al.[11] analysed 77 supracondylar humerus fracture procedures from July 2004 to October 2009. These fractures were divided into 37 cases having reduction during office hours (8:00-20:00) and 40 cases having reduction during after-hours (20:00-8:00). 10 Gartland II fractures and 67 Gartland III fractures were included. The Gartland classifications were not reported separately for the office hours and after-hours group, neither were any other factors influencing the decision of timing of reduction.
The primary outcome was loss of reduction during follow-up. Secondary outcomes were number of pins used, adequate initial reduction, number of cortical purchases and technical quality of pinning, lateral only pinning, technical errors, technical quality of pinning (which was sufficient when the anterior humeral line passed through the middle of the capitellum, the Baumann angle is restored and the medial and lateral column are intact). Outcome evaluation was done by reviewing the intraoperative X-rays , and comparing these to those acquired immediately after reduction, and after three weeks postoperatively. Four different pinning constructions were used, namely; a) two lateral pins b) three lateral pins c) crossed pins with one medial and one lateral entry pin and d) two lateral and one medial entry pin. A multivariate logistic regression analysis was done to analyse individual factors causing loss of reduction.
No significant difference in terms of loss of reduction was found between the office hours and the after-hours group: seven cases were found with a loss of reduction after three weeks in both the office hours and the after-hours group, i.e. 7/37 (19%) vs. 7/40 (18%, p=1.00). The article did not report differences in secondary outcomes between both groups. Assessing the patient group with loss of reduction, lateral pinning (odds ratio: 7.73, p=0.029) and technical errors (odds ratio: 57.63, p=0.001) were associated with loss of reduction. No associations were found with the number of pins used, adequate initial reduction, number of cortical purchases and technical quality of pinning. The authors suggest that loss of reduction following fracture fixation is closely related to technical errors, which often results in inadequate reduction. However, as these technical errors were evenly distributed between office hours and after-hours, the authors concluded that timing of the procedure was not associated with loss of reduction.

Overall outcomes

Primary outcomes

Of the three articles, Aydogmus et al.[7] found a significant difference in poor fixation between office hours and after-hours: 4 patients (9%) in the office hours group had a clinically relevant poor fixation, compared to 17 (39%) in the after-hours group. Paci et al.[10] found that borderline significantly more malunion was present in the “night” subgroup (2/26, 8%) versus the “all groups but night” group (2/236, 1%) (p=0.05). Balakumar et al.[11] did not find a significant difference in loss of reduction between their office hours and after-hours groups, as this was present in 7/37 (19%) in the office hours group and 7/40 (18%) in the after-hours group (p=1.00).

Secondary outcomes

No significant differences between groups were found for functional outcomes, length of hospital stay, numbers of open reductions needed, numbers of postoperative complications, and duration of surgery between office hours and after-hours, in any of the articles.

Discussion

Obtaining immediate reduction and supposedly an optimal clinical outcome are often arguments to perform supracondylar humerus fracture reduction during after-hours. Still, more and more surgeons prefer to postpone surgery to office hours as it is generally assumed that after-hours surgery provides additional risks for patients[12] In this literature study using a PICO method, we found three relevant (retrospective) articles reporting outcomes of office hours and after-hours surgery in patients with supracondylar fractures.

Primary outcomes

Aydogmus et al.[7] found a significantly higher rate of poor fixation in the after-hours group, compared to the office hours group. However, this higher rate of “poor fixation” apparently did not result in a loss of range of motion in the after-hours group. Paci et al.[10] demonstrated a borderline significant difference in malunion rate when comparing their “all groups but night” subgroups to their “night” (23:00-6:00) subgroup, with a higher malunion rate in the latter. On the other hand, there was on average, a significantly higher Gartland classification in the night group of Paci et al.[10], compared to the office hours group: i.e. more severe fractures appear to have been treated with minimal delay, i.e. during after-hours if deemed necessary (confounding by indication). In addition, there was a higher percentage of reductions being performed by a fellow at night (performance bias). Both are potential confounders for the identified inferior outcomes of the night hours group (selection bias). No other significant differences in outcomes were found for the primary outcomes in all three studies.

Secondary outcomes

With regards to secondary outcomes, no clinically or statistically significant differences were found between office and after-hours groups, with regards to: operative duration, range of motion, carrying angle, surgical method, placement of any medial pins, operation time, neurovascular complications, successful reduction rate, successful fixation rate, range of motion, functional flexion and extension and any induced deformity.

Early versus delayed reduction

The aforementioned results suggest that the influence of surgery timing on radiological and functional outcomes in supracondylar humerus fractures is limited. Still, in order to draw more definite conclusions about this topic, it is also important to assess differences in outcomes between direct reduction and delayed reduction, regardless of day and night. Hence, postponing reduction to office hours implies a delay in reduction. In our literature evaluation, only the article of Aydogmus et al.[7] assessed the waiting time between fracture and reduction between the groups. The article found no significant difference in this factor between their office hours and after-hours groups. Recently, an extensive review was published on this topic of delaying supracondylar humerus fracture reduction, regardless of day and night.[13] This review assessed the outcomes of 1735 patients from 12 articles, and evaluated the functional outcomes of early reduction, compared to delayed reduction. The results of this review are in accordance with our CAT; the authors found no strong evidence that delaying reduction influences the outcomes of surgery negatively or positively.

Strengths and limitations of this study

To our knowledge, this is the first report that summarizes results on after-hours surgery for supracondylar humerus fractures, thus it should contain the most up-to-date conclusions on this topic. There are some factors that should be taken into consideration when interpreting the outcomes of our study. First of all, only three relevant articles were found. All of these are retrospective and with methodological limitations, while, for example, an RCT setting would be preferable. This experimental setting would for example evade confounding by indication. In addition to this, literature on the topic of supracondylar humerus fractures at night is scarce. Furthermore, it is also important to note that in, our articles, the decision of performing surgery at night might be dependent on the trauma severity, and on the alleged risk of complications that postponing the reduction might cause for the individual patient. Therefore, a selection bias might be present due to the fact that reduction for fractures with a higher Gartland classification is less likely to be postponed. The quantity of possible bias differs between the articles included, as Aydogmus et al. included solely Gartland 3 fractures, Paci included Gartland 2, 3 and 4 fractures, and Balakumar included Gartland 2 and 3 fractures. Paci et al. reported this selection bias and made an effort to minimize this bias by using exclusion criteria and multivariable logistic regression in order to control for differences in baseline characteristics. The other articles in our study did not report on these potential causes of bias. Another limitation to the current study is that all three studies have relatively small research groups, and quite heterogeneous primary outcome measures.

Comparison to the Dutch guideline for paediatric fractures

This CAT was compared to the Dutch guideline for paediatric fractures of 2018[14]. This guideline strongly recommends to always have a specialized team available, including a pediatric surgeon, for the treatment paediatric fractures in general, also after-hours. However, we cannot support this for supracondylar humerus fractures specifically, based on this PICO review.

Conclusion and recommendations

In this literature study, we investigated the question “does after-hours surgery, compared to surgery during office hours result in clinically or statistically significant different outcomes in follow-up, in terms of successful reduction, function and complications?”. We found weak evidence for higher "poor fixation" and “malunion” rates for after-hours surgery. However, clinical implications seem limited: no significant differences were found in any of the articles for other outcomes in follow-up, including other complications and postoperative elbow function. Additionally, literature comparing early versus delayed surgery of supracondylar humerus fractures, shows no significant differences between groups. Concluding, it appears safe to postpone surgery for Gartland 2, 3 or 4 fractures to office hours if circumstances are not optimal for surgery (e.g. no dedicated surgeon available), and if there is no contraindication for the patient.

The authors declare no conflict of interest.

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References

1. Saeed W, Waseem M. Elbow Fractures Overview. StatPearls. Treasure Island (FL)2019.
2. Barr L. Paediatric supracondylar humeral fractures: epidemiology, mechanisms and incidence during school holidays. Journal of Children's Orthopaedics, 8(2), 2014;pp.167-170.
3. Scherl SA, Schmidt AH. Pediatric trauma: getting through the night. Instr Course Lect. 2010;59:455-63.
4. Tomaszewski R, Wozowicz A, Wysocka-Wojakiewicz P. Analysis of Early Neurovascular Complications of Pediatric Supracondylar Humerus Fractures: A Long-Term Observation. BioMed Research International. 2017;2017:1-5.
5. Gartland JJ. Management of supracondylar fractures of the humerus in children. Surg Gynecol Obstet. 1959;109(2):145-54.
6. Sahu RL. Percutaneous K-wire fixation in paediatric Supracondylar fractures of humerus: A retrospective study. Niger Med J. 2013;54(5):329-34.
7. Aydogmus S, Duymus TM, Kececi T, Adiyeke L, Kafadar AB. Comparison of daytime and after-hours surgical treatment of supracondylar humeral fractures in children. J Pediatr Orthop B. 2017;26(5):400-4.
8. Halvachizadeh S, Teuber H, Cinelli P, Allemann F, Pape H, Neuhaus V. Does the time of day in orthopedic trauma surgery affect mortality and complication rates?. Patient Safety in Surgery. 2019;13(1).
9. da Costa Santos CM, de Mattos Pimenta CA, Nobre MR. The PICO strategy for the research question construction and evidence search. Rev Lat Am Enfermagem. 2007;15(3):508-11.
10. Paci GM, Tileston KR, Vorhies JS, Bishop JA. Pediatric Supracondylar Humerus Fractures: Does After-Hours Treatment Influence Outcomes? J Orthop Trauma. 2018;32(6):e215-e20.
11. Balakumar B, Madhuri V. A retrospective analysis of loss of reduction in operated supracondylar humerus fractures. Indian J Orthop. 2012;46(6):690-7.
12. Carter CT, Bertrand SL, Cearley DM. Management of pediatric type III supracondylar humerus fractures in the United States: results of a national survey of pediatric orthopaedic surgeons. J Pediatr Orthop. 2013;33(7):750-4.
13. Farrow L, Ablett AD, Mills L, Barker S. Early versus delayed surgery for paediatric supracondylar humeral fractures in the absence of vascular compromise: a systematic review and meta-analysis. Bone Joint J. 2018;100-B(12):1535-41.
14. Fracturen bij kinderen - Richtlijn - Richtlijnendatabase. Richtlijnendatabase.nl. 2018. https://richtlijnendatabase.nl/richtlijn/fracturen_bij_kinderen.html

Inhoud

Popliteus tendon impingement after correct-sized total knee arthroplasty, a case report

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Popliteus tendon impingement after total knee arthroplasty is a complication that is not frequently diagnosed in correct-sized total knee arthroplasty. Popliteus tendon impingement can be diagnosed by ultrasound guided analgesic injections and is mostly managed by conservative treatment. However, in this case report we describe a 62-year-old female with posterolateral knee pain after a total knee arthroplasty which was treated surgically. Postoperative X-rays did not show any sign of complications. X-rays also confirmed that no under- or oversized prosthetic components were used. The total knee prosthesis showed a good functional outcome, but ultrasound imaging showed tendinopathy of the popliteus tendon . Initial treatment consisted of ultrasound guided injections in the popliteus tendon region. Eventually, the popliteus tendon had to be released surgically to obtain a long-term satisfactory result. Popliteus tendon impingement after total knee arthroplasty should be considered as a possible cause for posterolateral pain after total knee arthroplasty. Surgical treatment could be considered when conservative treatment fails to provide lasting satisfactory results.

Introduction

Total knee arthroplasty (TKA) is one of the most effective treatment options for end-stage knee osteoarthritis to improve function and reduce pain.[1] Residual pain after joint replacement is a common complication after TKA.[2] A rare cause for residual pain is popliteus tendon impingement (PTI). During surgery, it is advised to protect the popliteus tendon (PT) while performing TKA, as it is prone to iatrogenic injury. Its transection can affect flexion gap balancing.[3,4] A recent study showed that PTI could play a role in residual pain and stiffness after TKA.[5] Diagnostic ultrasound-guided injections with anesthetics may confirm PTI and can, in combination with local corticosteroids, provide symptomatic pain relief in some patients.[6] To our knowledge, there are only a few studies available regarding post-operative anatomical impingement and most of them are cadaveric studies. In addition, there is no recent literature available concerning arthroscopic versus open surgical treatment when conservative treatment fails.[6-8] We report a case where PTI after TKA is identified as cause for residual posterolateral knee pain, treated with a lateral mini arthrotomy to release the popliteus tendon (PT) and scar tissue.

Patient

A 62 year old woman visited the outpatient clinic in 2013. Her X-ray showed a Kellgren and Lawrence (K&L) classification grade 4 osteoarthritis of the left knee. Her medical history of the left knee consisted of an open medial meniscectomy and arthroscopic partial lateral meniscectomy. Previously, varicose surgery was done in the back of the left knee. Conservative treatment through several intra-articular injections with bupivacaine/triamcinolone was started in 2010, but appeared no longer a sufficient treatment option.

A Cruciate Retaining (CR) Triathlon total knee prosthesis (Stryker) was implanted. A femoral and tibial size 5 component with a 13 mm insert were implanted. Initially, 6 weeks after surgery, a functional range of motion and good stability were regained. However, a few months after surgery our patient developed posterolateral knee pain. Imaging by conventional X-rays (*figure 1 and 2*) and examination of the inflammatory parameters by blood tests did not show any manifestations of peri-prosthetic joint infection or (septic) loosening of the prosthetic components. No additional CT-scan was made since there was no clinical or radiological suspicion of loosening or mal-positioning of the components.

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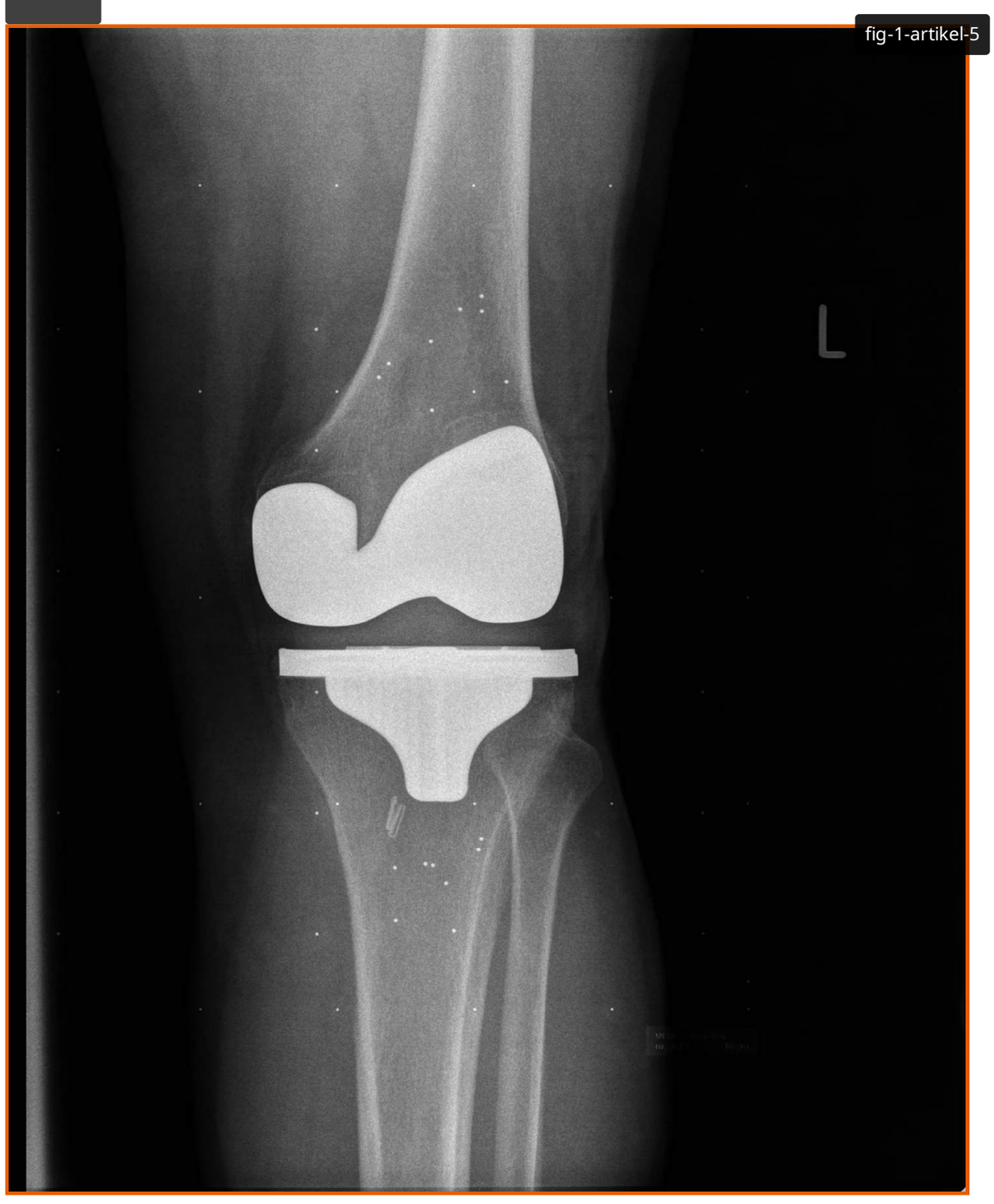

Fig 1: Anterior posterior view of the TKA 5 years after surgery

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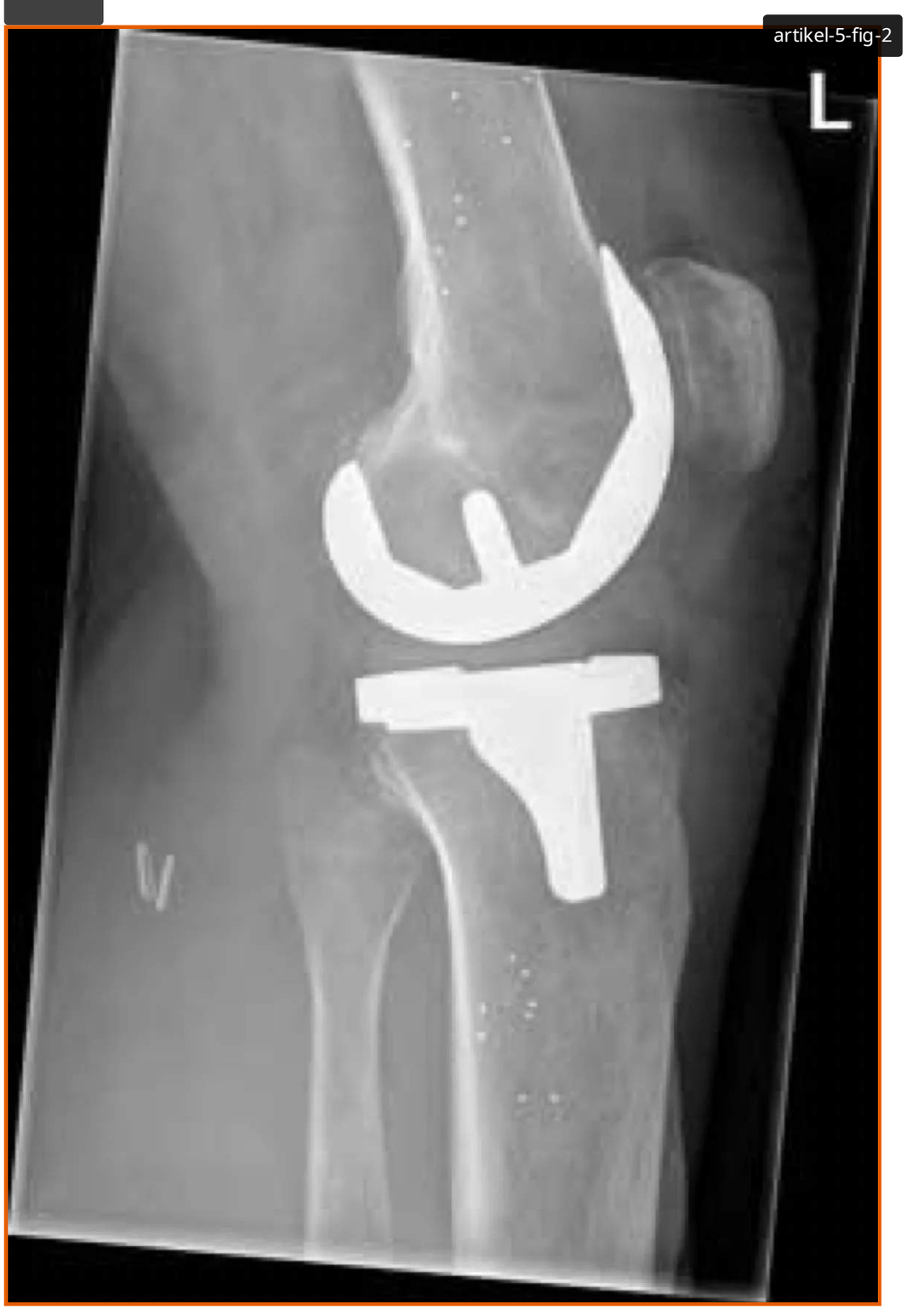

Fig 2: Lateral view of the TKA 5 years after surgery

Six months after TKA ultrasound (US), showed an inflamed bursa, between the popliteus tendon and posterior tibia. This was treated with a local injection (bupivacaine/triamcinolone), unfortunately without any pain relief. She was referred to the department of sports medicine for stretch exercises guided by a physiotherapist. The patient returned three years after TKA to our outpatient clinic with persistent pain in the posterolateral region of the knee. US showed no signs of tendinitis and a (diagnostic) US guided injection with bupivacaine/triamcinolone in the PT was performed. In contrast to the previous bursal injection, this time all preexisting pain was reduced by the injection. Therefore, we concluded that the pain was most likely attributed to impingement of the PT. In 1,5 years, three US guided PT injections were performed. All showed a good short-term reduction of knee pain. Five years after the primary surgery we recommended surgical transection of the PT, aiming for a long-term benefit. In context of shared decision making, the patient decided that the chance of pain relief outweighed the potential chance of knee instability after transection of the PT. The patient consented that her data, including her radiographic imaging, could be used for publication.

Intervention

The procedure was performed while using a tourniquet to minimize blood loss. A 4-cm vertical skin incision was made at the joint line, just posterior to the lateral collateral ligament, as described by Medvecky et al.[9] An interval between the short head of the m. biceps femoris and the iliotibial band was opened up. With the knee joint in 90 degrees flexion, the PT was exposed posterior to the lateral collateral ligament (LCL). The PT was not completely visualized due to the overlying lateral collateral ligament, extra care was taken during the lateral release. When inspecting the PT in situ there was visual damage and fibrotic tissue. The PT was released mid-section at the posterolateral side of the knee, no evident retraction along the femoral condyle was seen during the release. The joint capsule and iliotibial tract were closed separately.

Outcome

Two weeks and two months after surgery there were no complications and 80% of the pain was relieved. Our patient was able to walk without pain. Her knee showed good function (120/0/0) and stability. The stability of the knee in 30 degrees flexion was less than a 5 mm movement anterior-posterior and less than a 5 degrees movement medial-lateral. After three months our patient was free of pain, and at the final follow up after 12 months she did not show any complications either. Our patient was satisfied and able to function without complaints.

Discussion

In total, approximately 20-30% of the patients are unsatisfied after primary TKA, of which a small portion might be contributed by PTI.[2,10] Oversized components can shift the popliteus position during a full arc of motion. However, Bonnin et al. also describes that despite a more physiological tracking of undersized components, even correct-sized tibial components can modify popliteal tracking, possibly resulting in PTI.[5] This is recognized in our case. In the case of postoperative dorsolateral knee pain and no signs of peri-prosthetic joint infection, loosening or oversized prosthetic components, then impingement of the PT should be considered as a possible cause. Ultrasound has the real-time capability to observe mechanical catching and be effective in the discovery and confirmation of PTI after TKA. US combined with a guided anesthetic injection as diagnostic treatment and steroid injection as potentially therapeutic.[11]

There is debate about whether PT should be preserved or transected during TKA. Transection may affect gap balancing in flexion and extension, and result in posterior flexion-instability. This was shown in a cadaver trial where cruciate-retaining (CR) and posterior stabilized (PS) prostheses were used, before and after the transection of the PT gaps were measured. The medial gap (in 90 degrees flexion: increase CR 0.8 mm, increase PS 1.4 mm | extension: increase CR 1.7 mm, increase PS 0.9 mm) was significantly increased after PT section in flexion and extension in the CR-TKA group, in the PS-TKA group the flexion gap was only significantly increased in flexion. The lateral gap (90 degrees flexion: increase CR 2.1 mm, increase PS 1.64 mm | extension: increase CR 1.4 mm, increase PS 1.7 mm) was significantly increased both in flexion and extension for the CR-TKA and PS-TKA group.[3] Most of the evidence shows that the PT should be preserved during total knee arthroplasty as general functional scores are shown to be lower in patients with an iatrogenic popliteal injury.[11]

Ghosh et al. state that the PT is crucial to posterolateral stability.[4] They compared PS-TKA with the native knee and concluded that in PS-TKA transection of de PT did not substantially generate abnormal knee laxity.[4] In our case, a CR primary TKA was implanted. Several studies describe an arthroscopic PT release as a reliable procedure for PTI after knee arthroplasty without compromising knee stability.[6,7] Our senior orthopaedic surgeon opted for a minimal open posterolateral PT release to have a better view and so preventing damaging the prosthesis during arthroscopy. Before performing this specific operation, the operation technique was first tested and performed on a cadaver.

Recommendation

The current literature on PTI after TKA is limited. PTI as a cause for residual pain after TKA might be underdiagnosed despite extensive literature on additional diagnostics in malfunctioning TKA. In the case of unknown posterolateral knee pain after TKA, PTI could be evaluated as a possible cause by using US imaging combined with US-guided injection with anesthetic as a diagnostic treatment and corticosteroid injection as a potential therapeutic treatment option. In the case of PTI, those injections could relieve the posterolateral knee pain. When injections of the PT are no longer a sufficient treatment option, surgical release of the PT could be considered with reasonable chances of long-term pain reduction.

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Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

References

1. Juni P, Reichenbach S, Dieppe P. Osteoarthritis: rational approach to treating the individual. Best Pract Res Clin Rheumatol. 2006;20(4):721-740.
2. Canovas F, Dagneaux L. Quality of life after total knee arthroplasty. Orthop Traumatol Surg Res. 2018;104(1S):S41-S46.
3. Cottino U, Bruzzone M, Rosso F, Dettoni F, Bonasia DE, Rossi R. The role of the popliteus tendon in total knee arthroplasty: a cadaveric study: SIGASCOT Best Paper Award Finalist 2014. Joints. 2015;3(1):15-19.
4. Ghosh KM, Hunt N, Blain A, et al. Isolated popliteus tendon injury does not lead to abnormal laxity in posterior-stabilised total knee arthroplasty. Knee Surg Sports Traumatol Arthrosc. 2015;23(6):1763-1769.
5. Bonnin MP, de Kok A, Verstraete M, et al. Popliteus impingement after TKA may occur with well-sized prostheses. Knee Surg Sports Traumatol Arthrosc. 2017;25(6):1720-1730.
6. Westermann RW, Daniel JW, Callaghan JJ, Amendola A. Arthroscopic Management of Popliteal Tendon Dysfunction in Total Knee Arthroplasty. Arthrosc Tech. 2015;4(5):e565-568.
7. Allardyce TJ, Scuderi GR, Insall JN. Arthroscopic treatment of popliteus tendon dysfunction following total knee arthroplasty. J Arthroplasty. 1997;12(3):353-355.
8. Barnes CL, Scott RD. Popliteus tendon dysfunction following total knee arthroplasty. J Arthroplasty. 1995;10(4):543-545.
9. Medvecky MJ, Noyes FR. Surgical approaches to the posteromedial and posterolateral aspects of the knee. The Journal of the American Academy of Orthopaedic Surgeons 2005;13(2):121-8
9. Gunaratne R, Pratt DN, Banda J, Fick DP, Khan RJK, Robertson BW. Patient Dissatisfaction Following Total Knee Arthroplasty: A Systematic Review of the Literature. J Arthroplasty. 2017;32(12):3854-3860.
10. Geanette C, Sahr M, Mayman D, Miller TT. Ultrasound Diagnosis of Osteophytic Impingement ofthe Popliteus Tendon After Total Knee Replacement. J Ultrasound Med 2018;37:2279-2283.
11. de Simone V, Demey G, Magnussen RA, Lustig S, Servien E, Neyret P. Iatrogenic popliteus tendon injury during Total knee arthroplasty results in decreased knee function two to three years postoperatively. Int. Orthopaedics. 2012;36(10):2061-2065.

Inhoud

Eponiemen
in de orthopedische chirurgie

M.P. Somford

Panner disease

The original

In his paper from 1929 Panner mentions discussing the cases that follow during a meeting in 1927. At that time he had collected two cases but at the time of the writing of his paper he could add another one. The reason for de the delay in publication of the cases was because he wanted to follow their development and course over time. Three cases are described in detail, 2 boys of 10 years old and one boy of 7 years old. It all concerned asymptomatic elbows that became painful after trauma. No fractures were found on radiological examination but all three had an aberrant aspect of the capitulum [auth: not capitellum] humeri. It is interesting to see that even though Panner was a radiologist, he seemed to have examined the patients elbow to great extend and also performed the follow-up clinically and radiological.
In his discussion he has the feeling the radiologic images have trauma as an incidental cause, but not as the essential one. The first stage is a flossy, uneven contour of the osseous centre of the capitulum humeri. In the subsequent course the osseous centre becomes smaller and gets deep indentations in the periphery. After shorter or longer time (longest seen is three years) the osseous centre becomes normal again. There is no connection between symptoms and greater or lesser deviation of the radiological findings from the normal.
He classifies this condition as being in the epiphysis, comparable to Calvé-Perthes [auth: Legg was probably added later], except the absent deformation, which is often present in Calvé-Perthes disease. He states that dr. Krebs in 1927 published a case and names it ‘Maladie de Panner’, making the condition an eponymous term before the first publication in a paper. The proposed treatment consists of exercising a certain care when using the affected arm[1]

The man

Hans Jessen Panner (13th of August 1871 - 11th of August 1930) was born in Rødby, Denmark.*(figure 1)* He was the son of a pharmacist. After studying medicine he started an internship in internal medicine in Germany and Austria. He decided however to pursue a career in radiology. In 1905 he became the head of the radiology department at the St Joseph Hospital in Copenhagen. He put a lot of effort in making radiology a separate specialty at the university in Denmark. His work and effort was troubled by him suffering from arthritis and later on diabetes, which also prevented him from becoming a professor of radiology. He was mainly interested in the radiology of the intestines and bone and joints. A particular interest was for the bone affections that arise around puberty. It is said that almost all radiologists in the 30’s in Denmark had been at some point his assistants. He was known for his kindly humour and warm genial spirit. He retired in 1928. He died in Helsingør and is buried in Frederiksberg.*(figure 2)*[2]

***Figure 1**: Hans Jessen Panner (orphan image).*

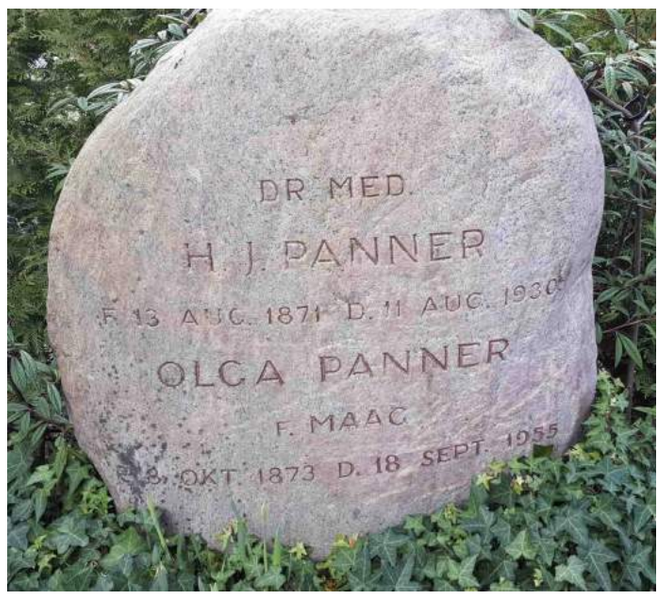

***Figure 2**: Gravestone of Hans Jessen Panner and his wife at the Frederiksberg cemetery.*

The clinical implication

Panner disease is an uncommon condition. It is mostly seen before the age of ten and 90% of the patients is male. Even today the aetiology is unclear. Preceding trauma is often seen but it remains uncertain whether this is the cause of Panner disease. Mostly the symptoms are pain and stiffness of the elbow, relieving with rest. Extension loss during physical examination is about 20 degrees and flexion loss is uncommon. The duration of symptoms ranges from several months to 2 years. The treatment is conservatively and most cases resolve without sequelae. Panner should not be confused with osteochondritis dissecans, which might have some similarities but needs different treatment.[3]

References

1. Panner HJ. A Peculiar Affection of the Capitulum Humeri, Resembling Calve-Perthes' Disease of the Hip. Acta radiol. 1929.
2. Baastrup CI. Hans Jessen Panner in Memoriam. Acta radiol 1930; 11: 347–349.
3. Claessen FMAP, Louwerens JKG, Doornberg JN, et al. Panner's disease: literature review and treatment recommendations. J Child Orthop 2015; 9: 9–17.

Inhoud

Voor auteurs

De redactie van het Wetenschap in Beweging aanvaardt in principe alleen bijdragen in de Nederlandse taal, die nog niet elders zijn gepubliceerd dan wel door een ander tijdschrift zijn aanvaard. De aangeboden bijdragen worden geacht niet tegelijkertijd aan een ander tijdschrift te worden aangeboden. Een uitzondering op deze regel is bewerking van een artikel dat in een niet-Nederlandstalig tijdschrift is gepubliceerd of voor publicatie is geaccepteerd, onder vermelding van dit feit, aanduiding van de referentie en met toestemming van de houder van het copyright. Het is de verantwoordelijkheid van de auteur dat voor publicatie van patiëntgegevens de patiënt toestemming heeft gegeven, of dat de gegevens zodanig bewerkt zijn dat deze niet terug te voeren zijn tot de betreffende patiënt.

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B: Hammes Th. De narcose, Leerboek, 3e druk. Amsterdam: Scheltema & Holkema's Boekhandel, 1919.
C: Wijhe M van. De lachgas-zuurstof narcose volgens Zaaijer. In: Lange JJ de, Mauve M, Reeser LDL, Rupreht J, Smalhout B, Bongertman-Diek JM, red.; Van Aether naar Beter. Utrecht: Wetenschappelijke Uitgeverij Bunge, 1988:39-44.
Tabellen dienen ín het Word-bestand te worden opgenomen. Iedere tabel moet worden samengesteld door middel van de tabelfunctie van het tekstverwerkingsprogramma. Voorzie elke tabel van een nummer in de volgorde waarin deze in de tekst voorkomt alsmede van een titel. Plaats elke tabel op een afzonderlijke pagina.
8. Tabellen dienen ín het manuscript-bestand te worden opgenomen, elk op een afzonderlijke pagina, ná de literatuurlijst. Iedere tabel moet worden samengesteld door middel van de tabelfunctie van het tekstverwerkingsprogramma. Voorzie elke tabel van een nummer in de volgorde waarin deze in de tekst voorkomt alsmede van een titel.
9. Figuren dienen als afzonderlijke digitale afbeeldingen te worden aangeleverd in het 'TIFF'-bestandsformaat. Elke figuur benodigt een minimale resolutie van 300 dots-per-inch (dpi) bij een minimum figuurbreedte van 20 cm. De bestandsnaam dient te zijn voorzien van de vermelding "Fig. + nummer" in de volgorde waarin deze in de tekst voorkomt. Elke figuur dient een onderschrift te krijgen. Alle onderschriften worden verzameld op een afzonderlijke pagina in het manuscript-bestand ná de literatuurlijst. Bij letters en tekens in de figuren dient rekening gehouden te worden met verkleining: gewoonlijk worden figuren verkleind naar de breedte van een kolom. Op microfoto's moet een lijnstuk met schaalverdeling worden aangebracht, waardoor de ware grootte van het object is af te lezen.
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(versie juni 2021)

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Wetenschap in Beweging
Juni 2021, Vol. 28, #1

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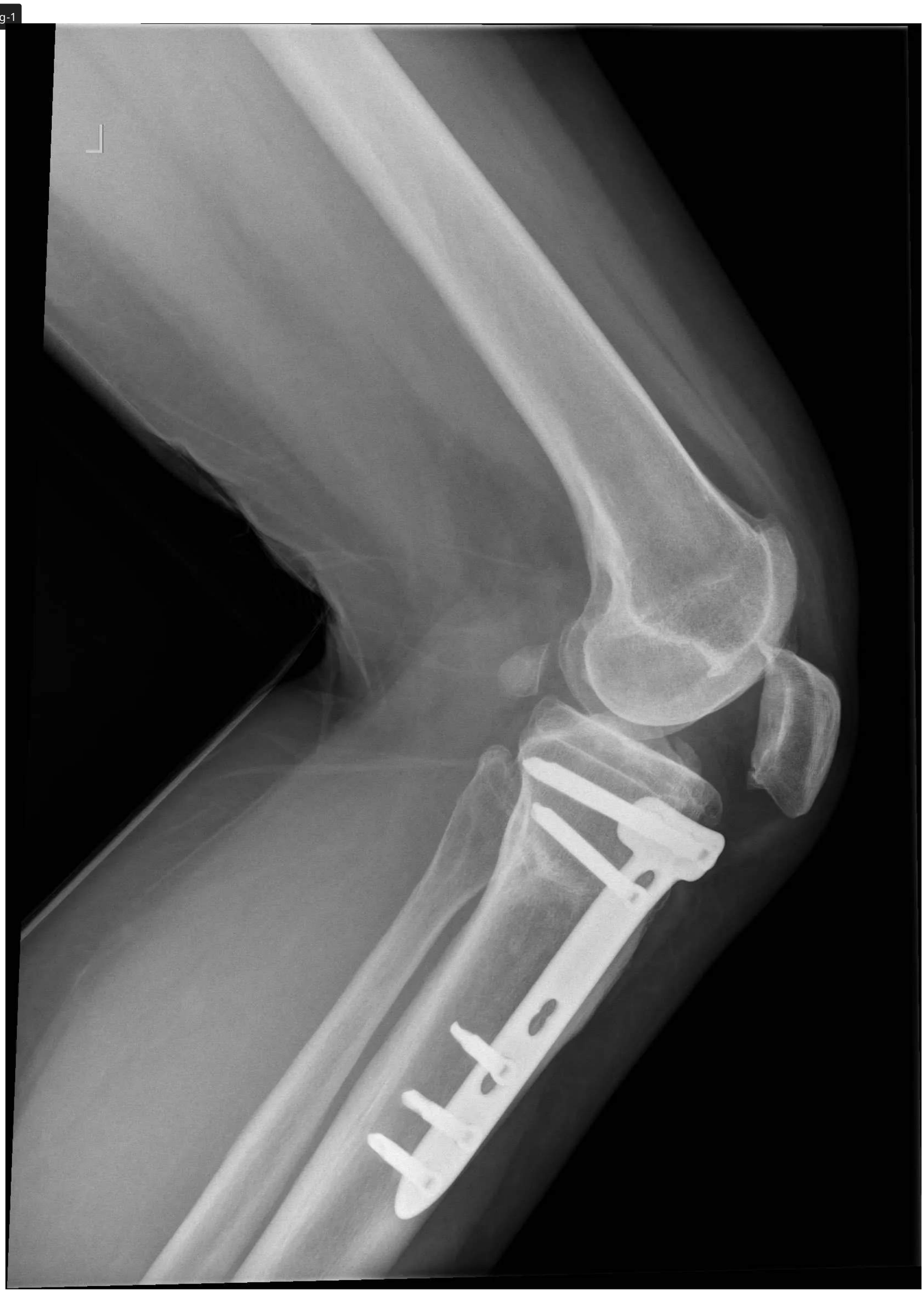
Inhoud

Fig-1



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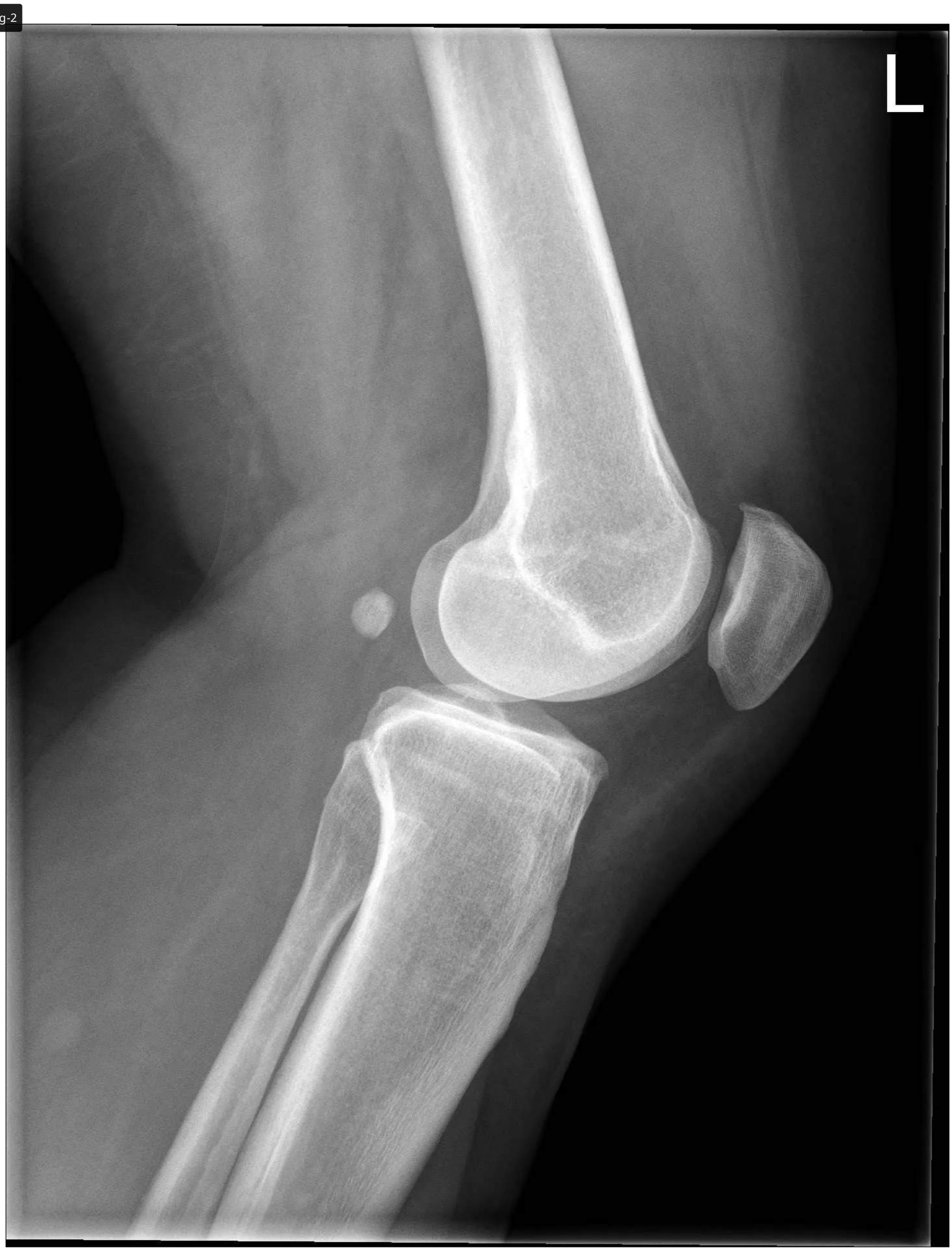

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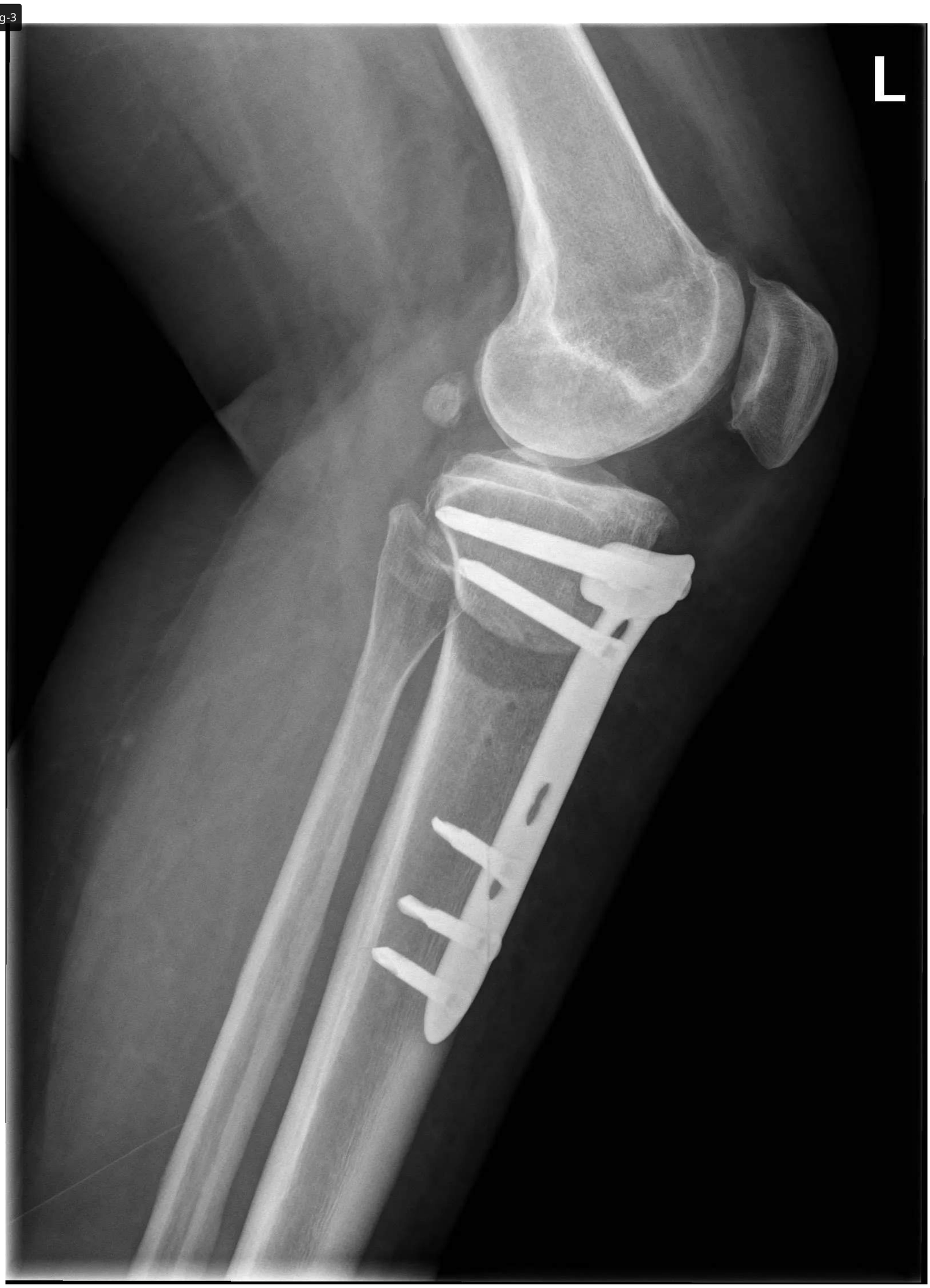

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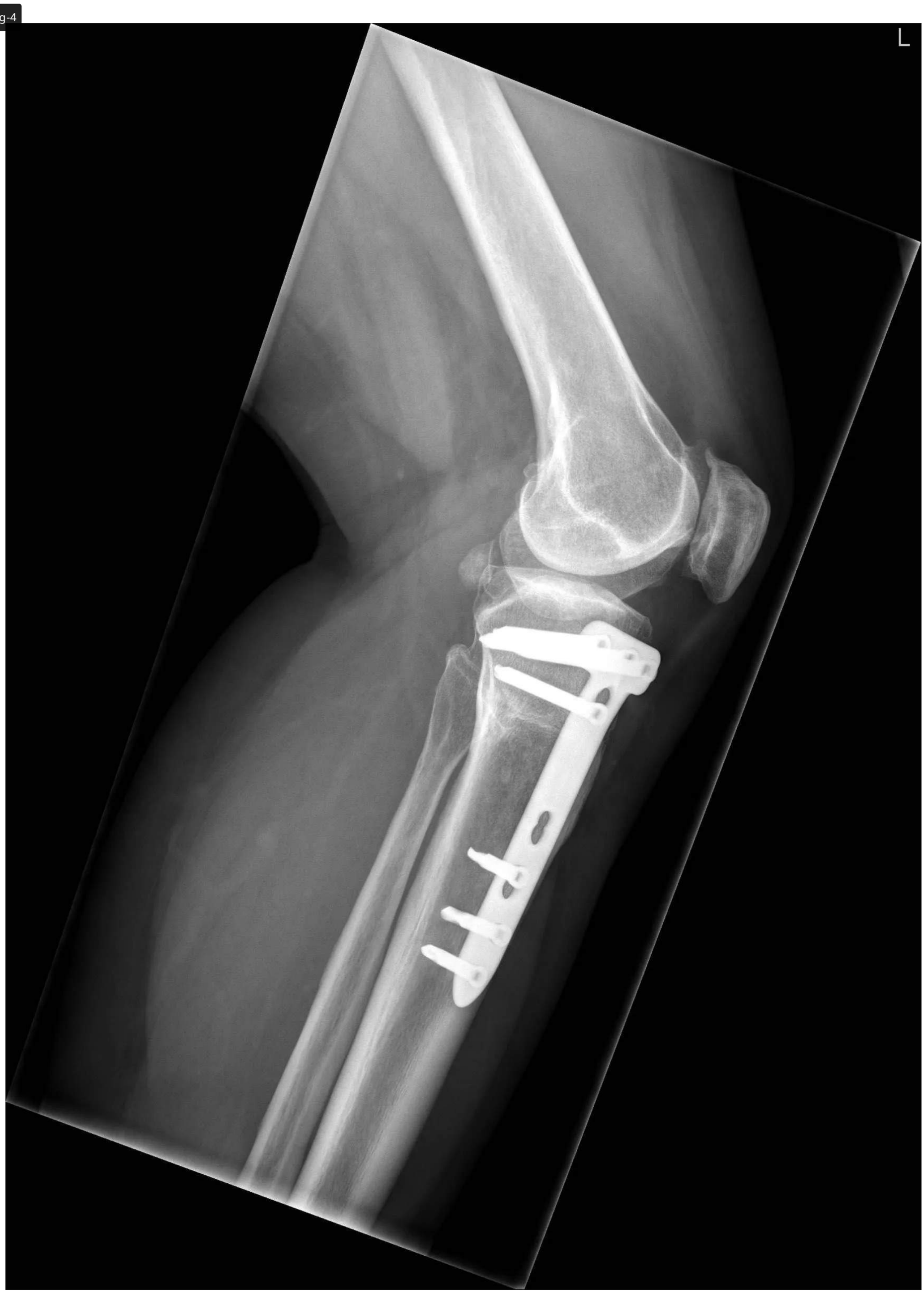

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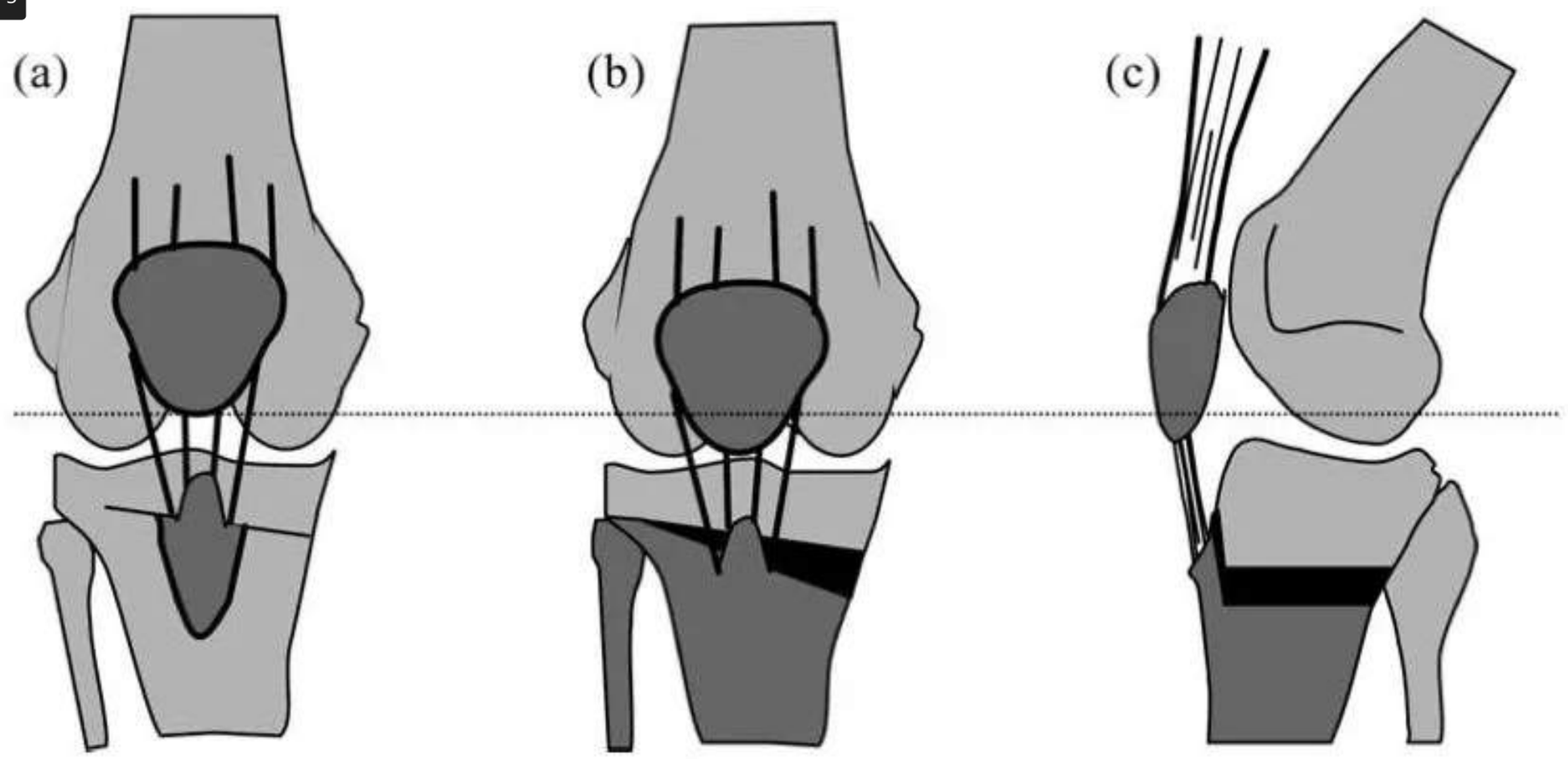

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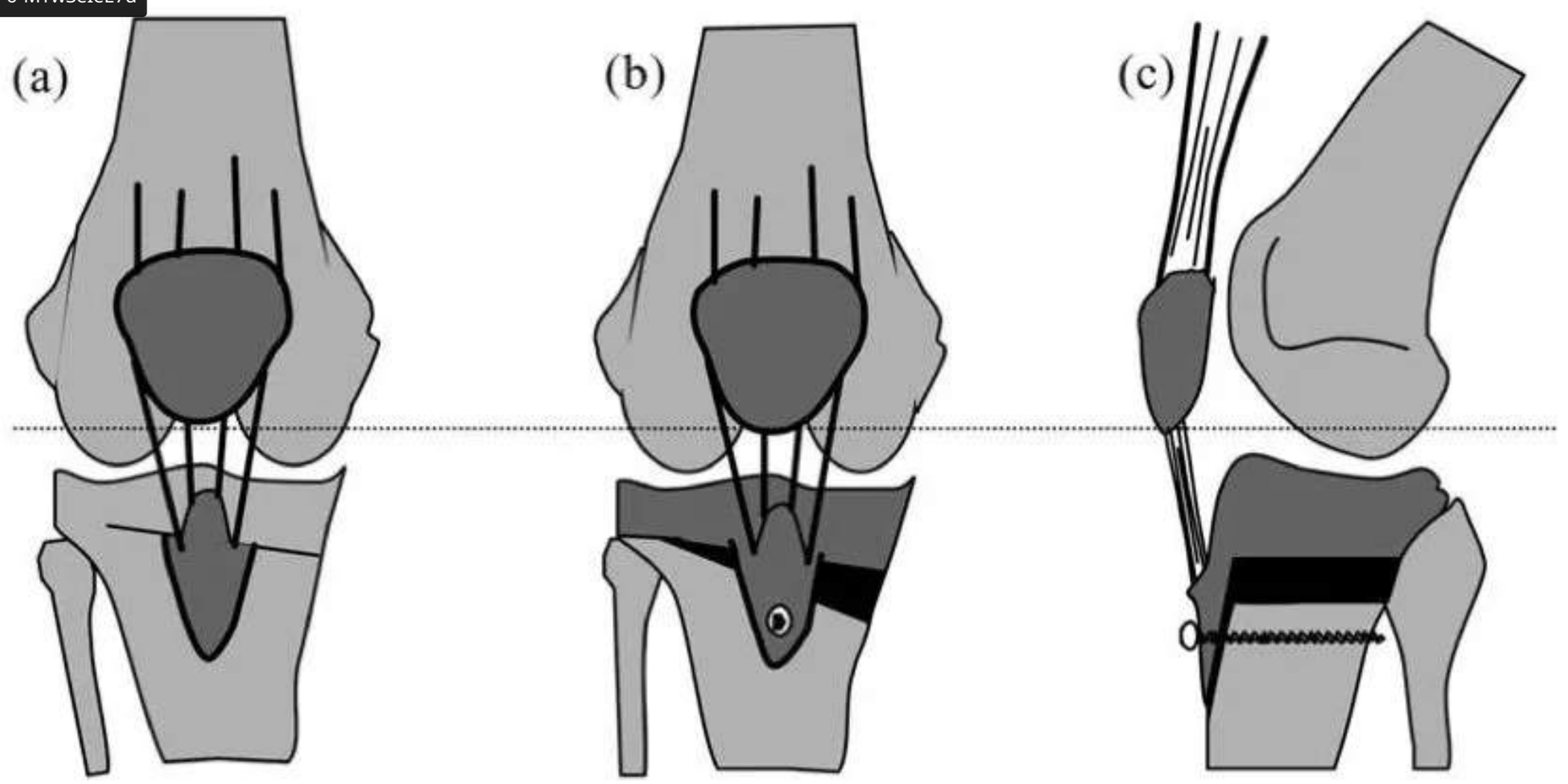

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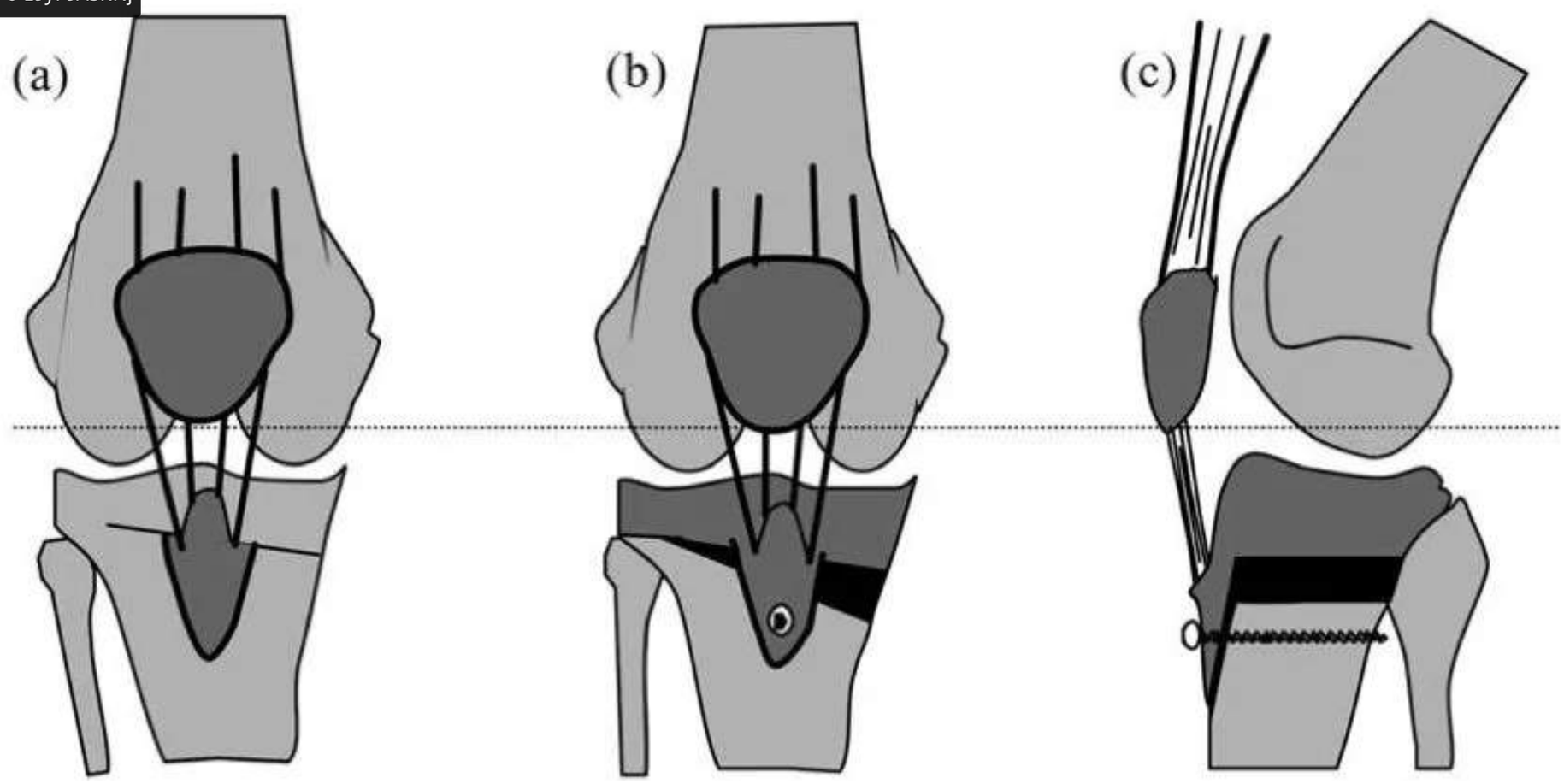

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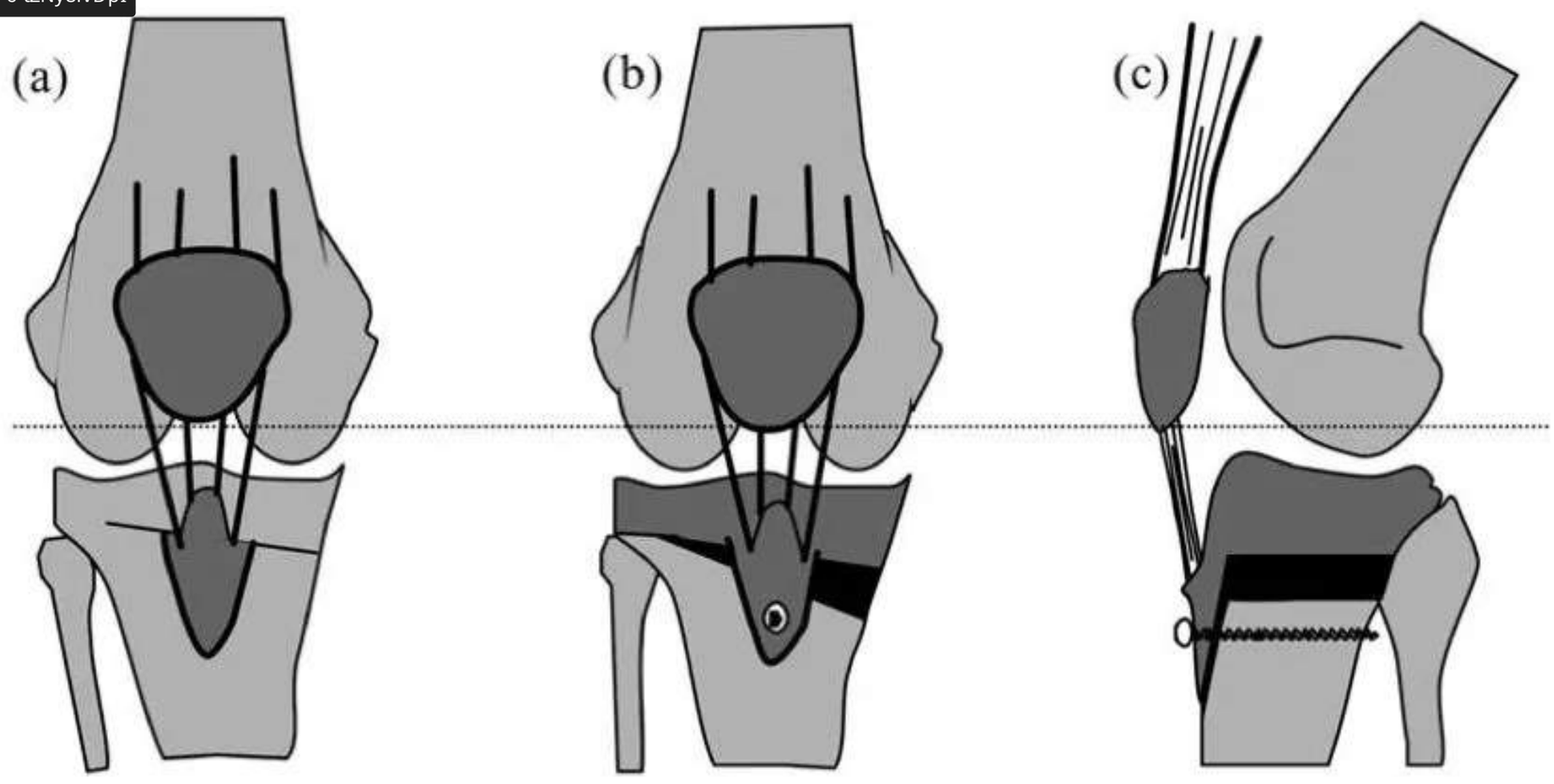

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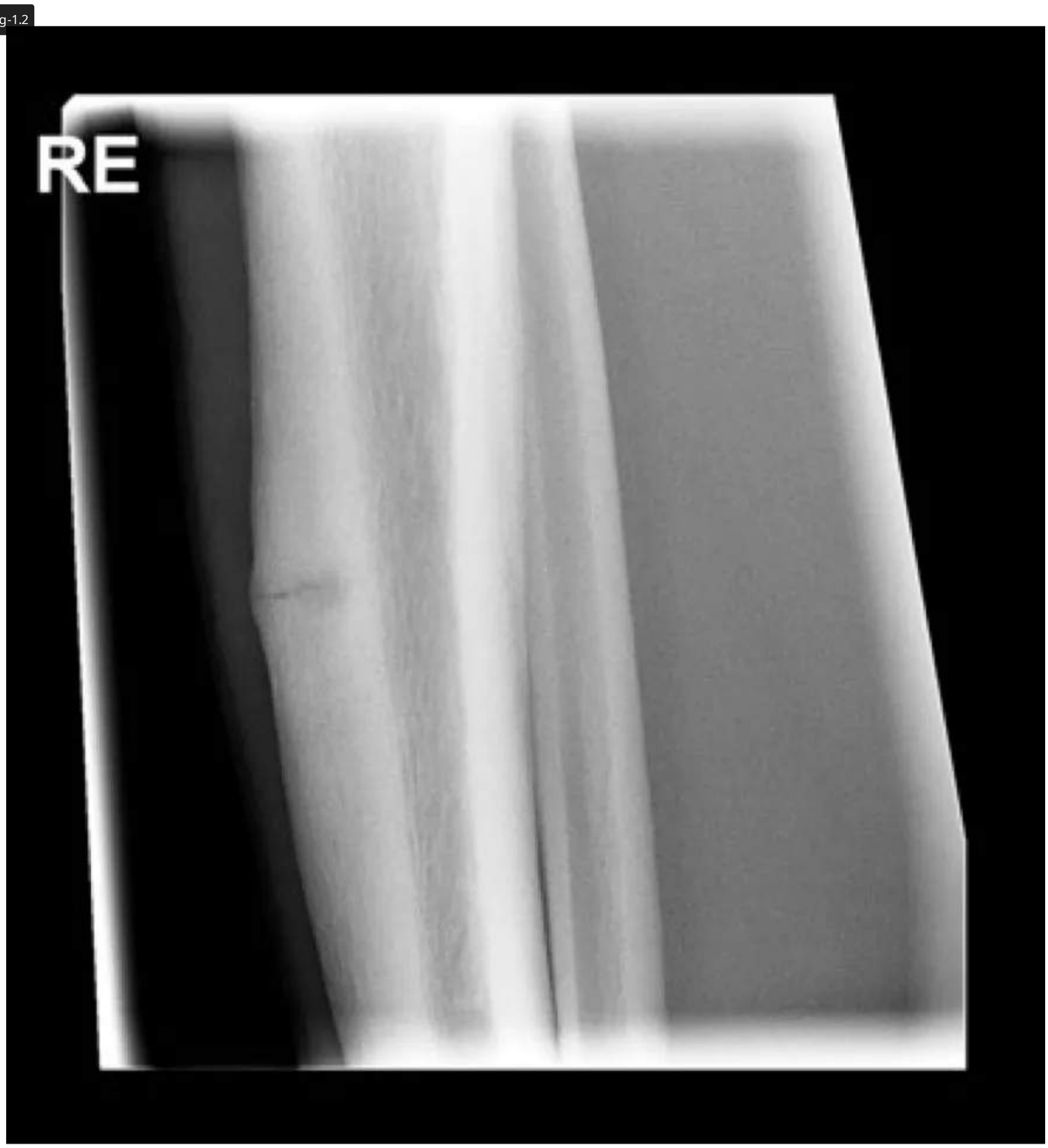
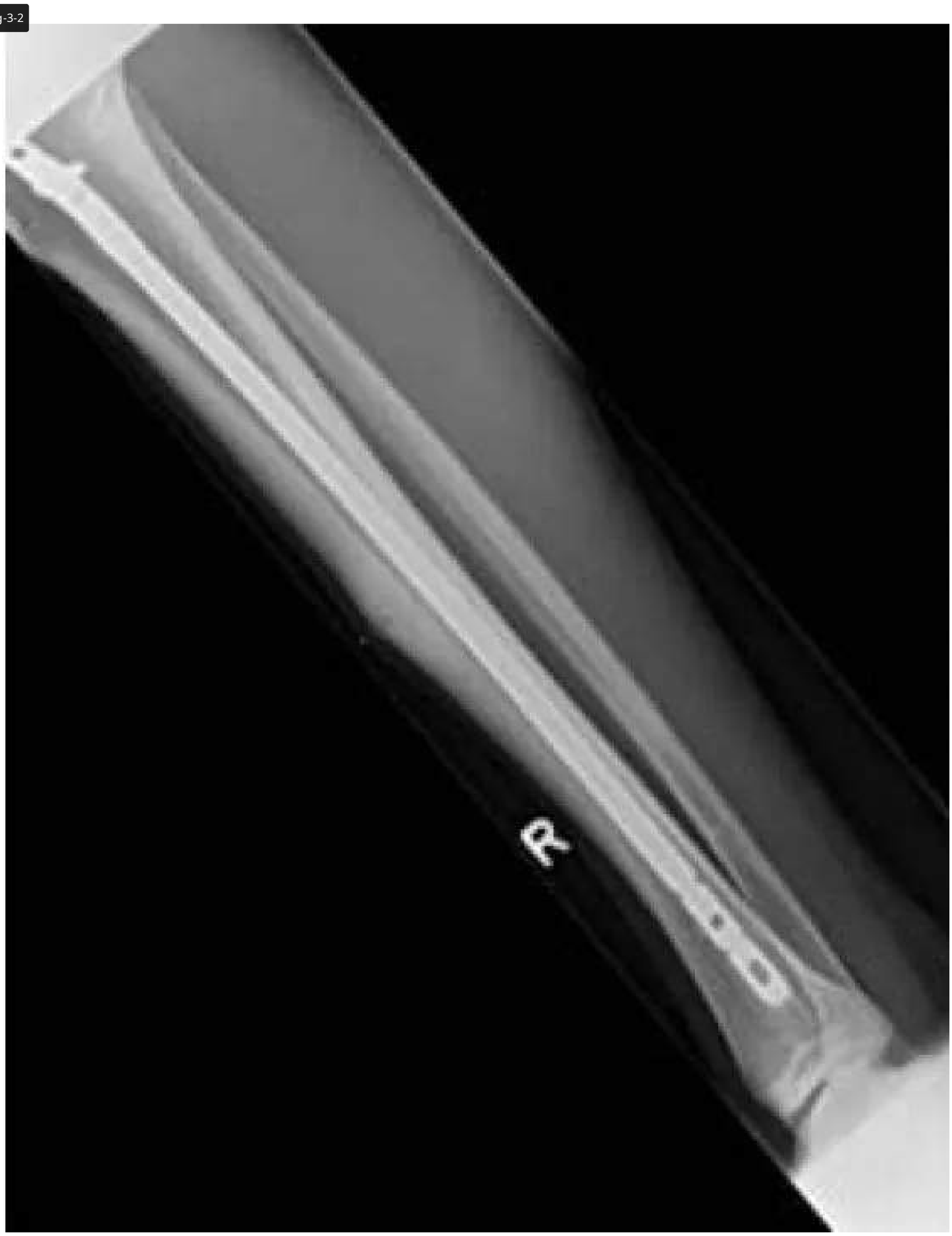


Table-1.2

Fig-3-2



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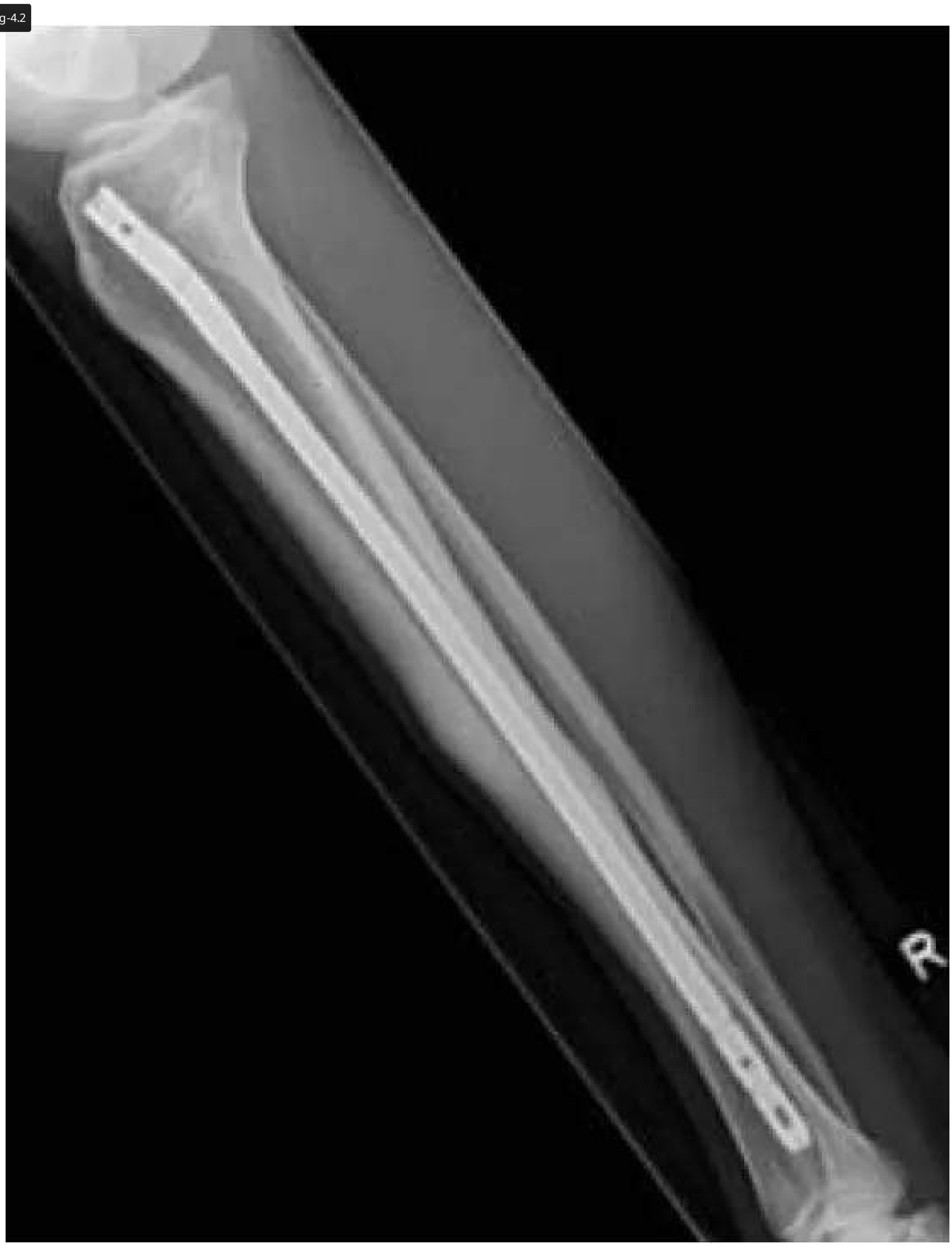


Fig-2.2

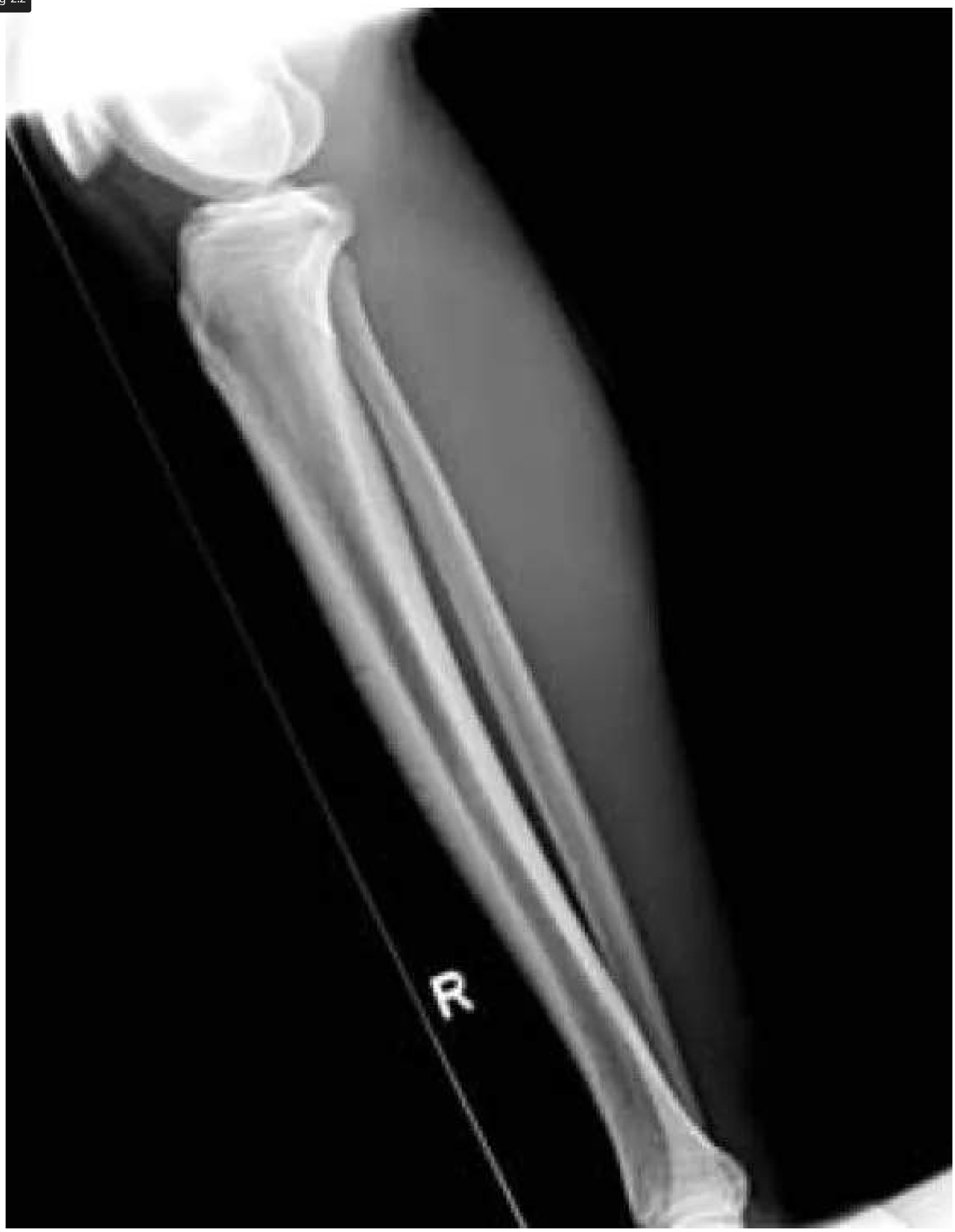


Fig-1.2.2.

TABLE 1. Radiologic grading of anterior tibia stress fractures.

1	No fracture line or cortical hypertrophy
2	Just cortical hypertrophy, but no fracture line
3	Fracture line with sharp margins and no widening (comparable to Torg type I)
4	(Widened) Fracture line related to bone resorption with associated periosteal bone union and/or endosteal bone formation (comparable to Torg type II)
5	Wide fracture line with periosteal new bone and radiolucency (comparable to Torg type III)

Figure-1.1

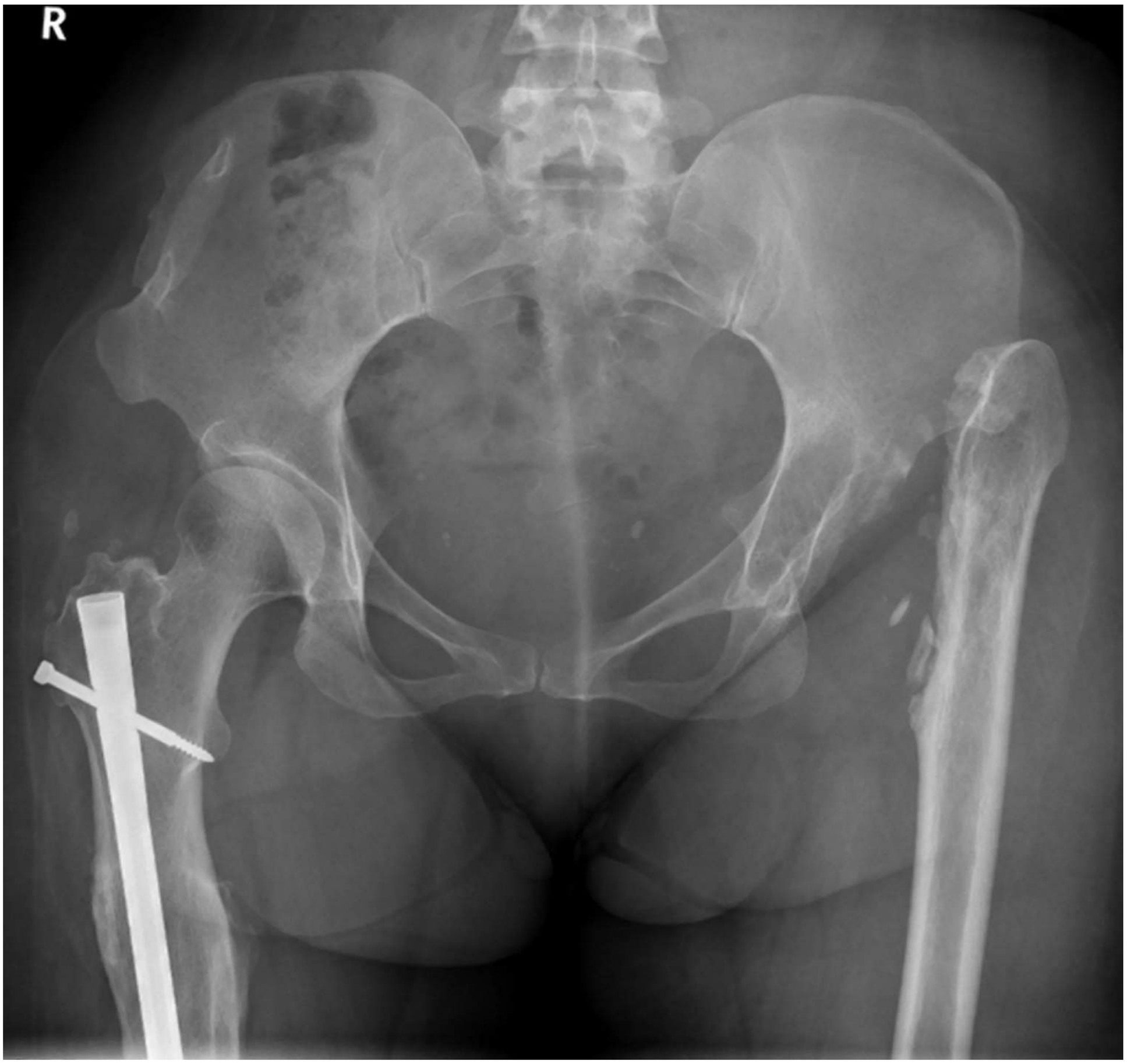
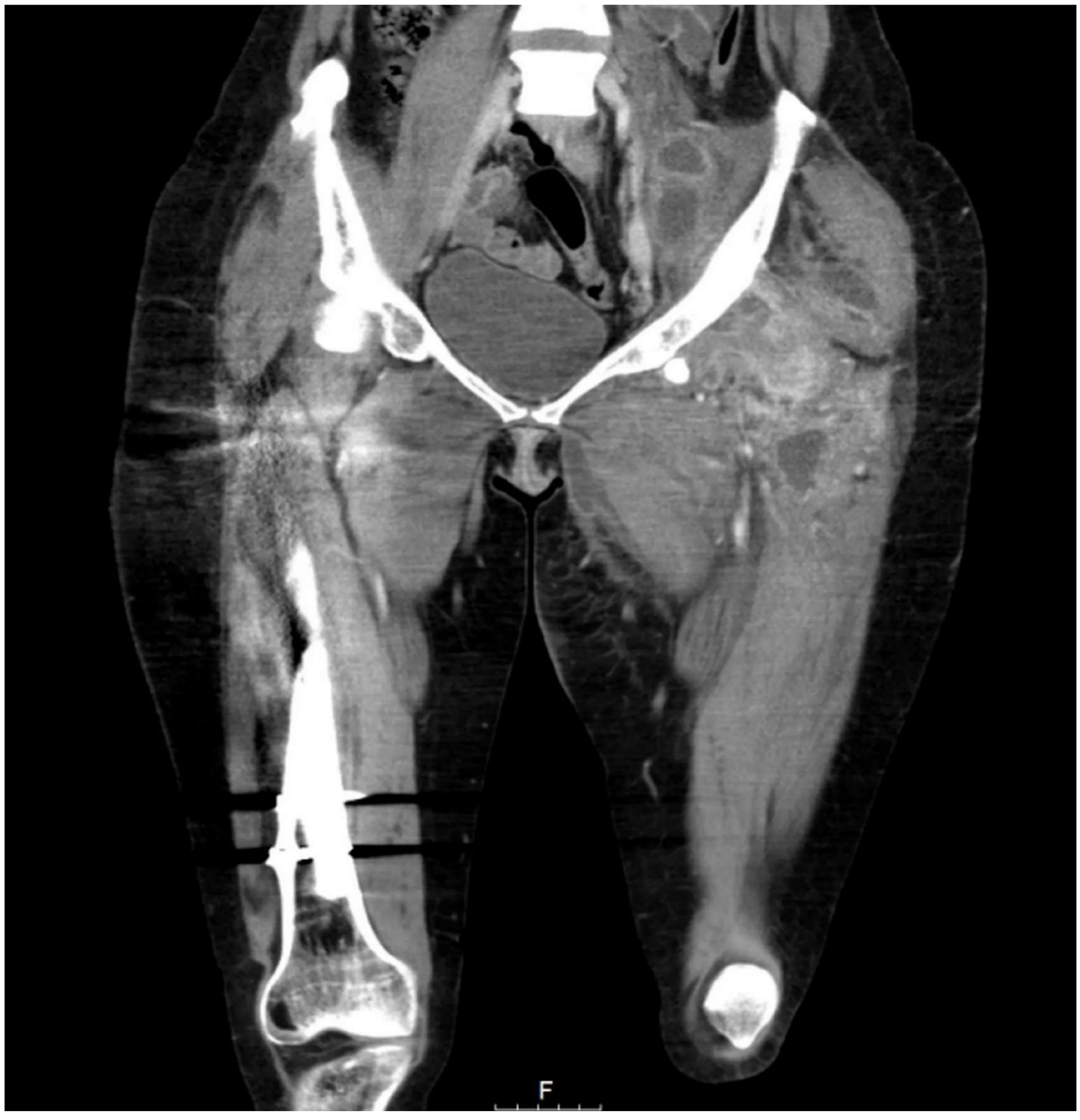


Figure-2.a.1



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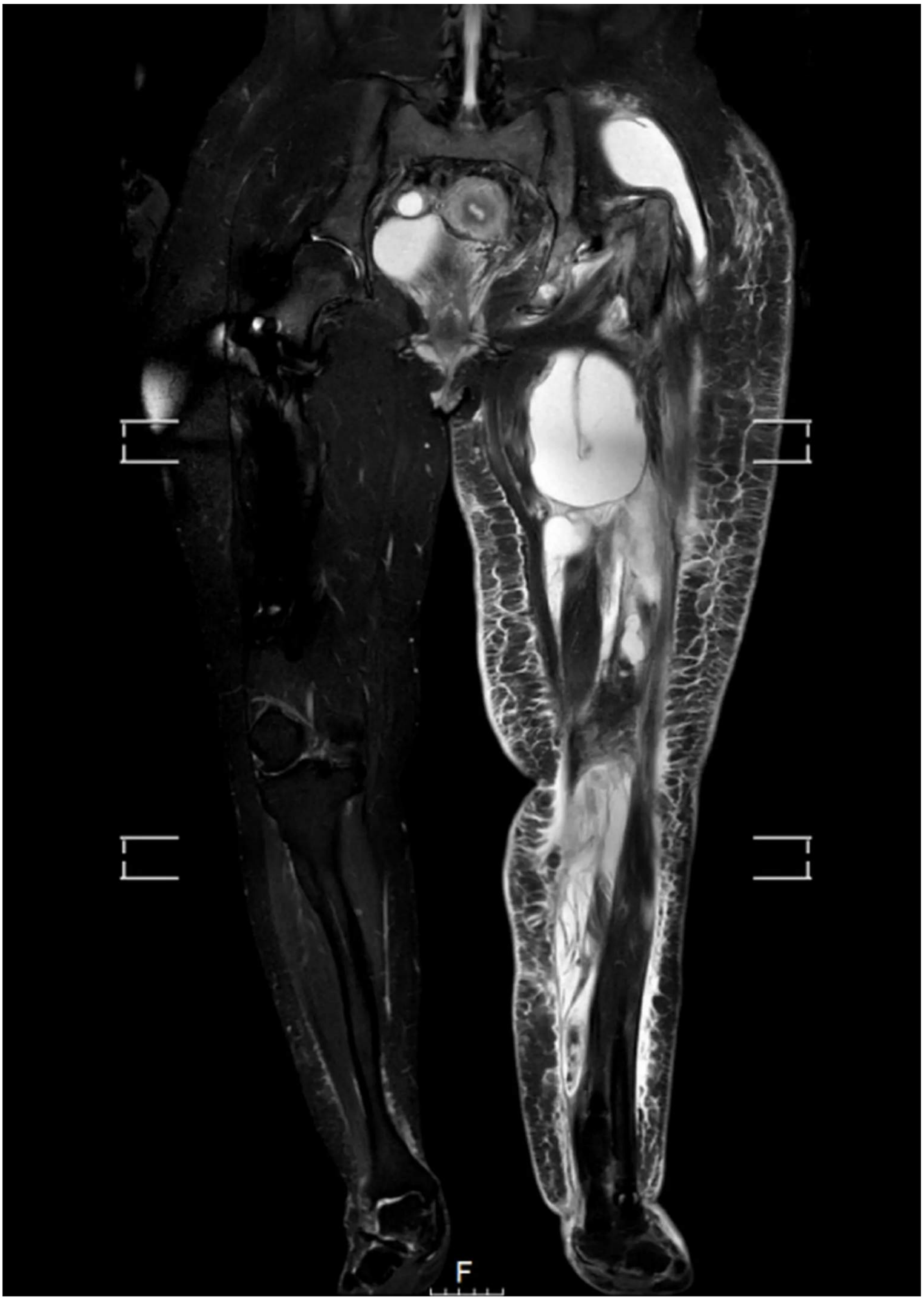


tabel-2.1

tabel-2.2

Fig-2-3

Figure 2. The variation in first-time patellar dislocation treatment across the respondents

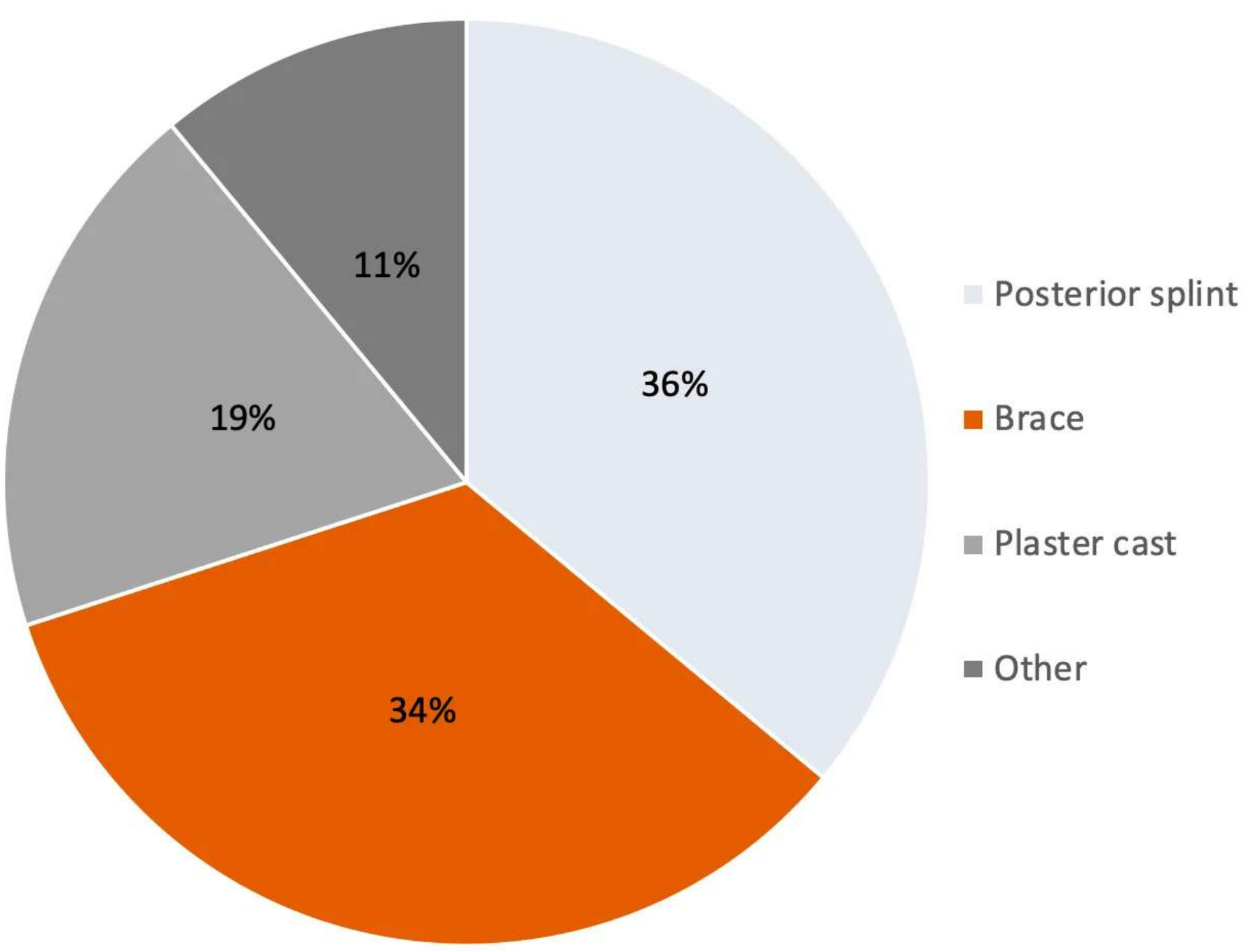


fig-3-3

Figure 3. Duration of treatment as responded

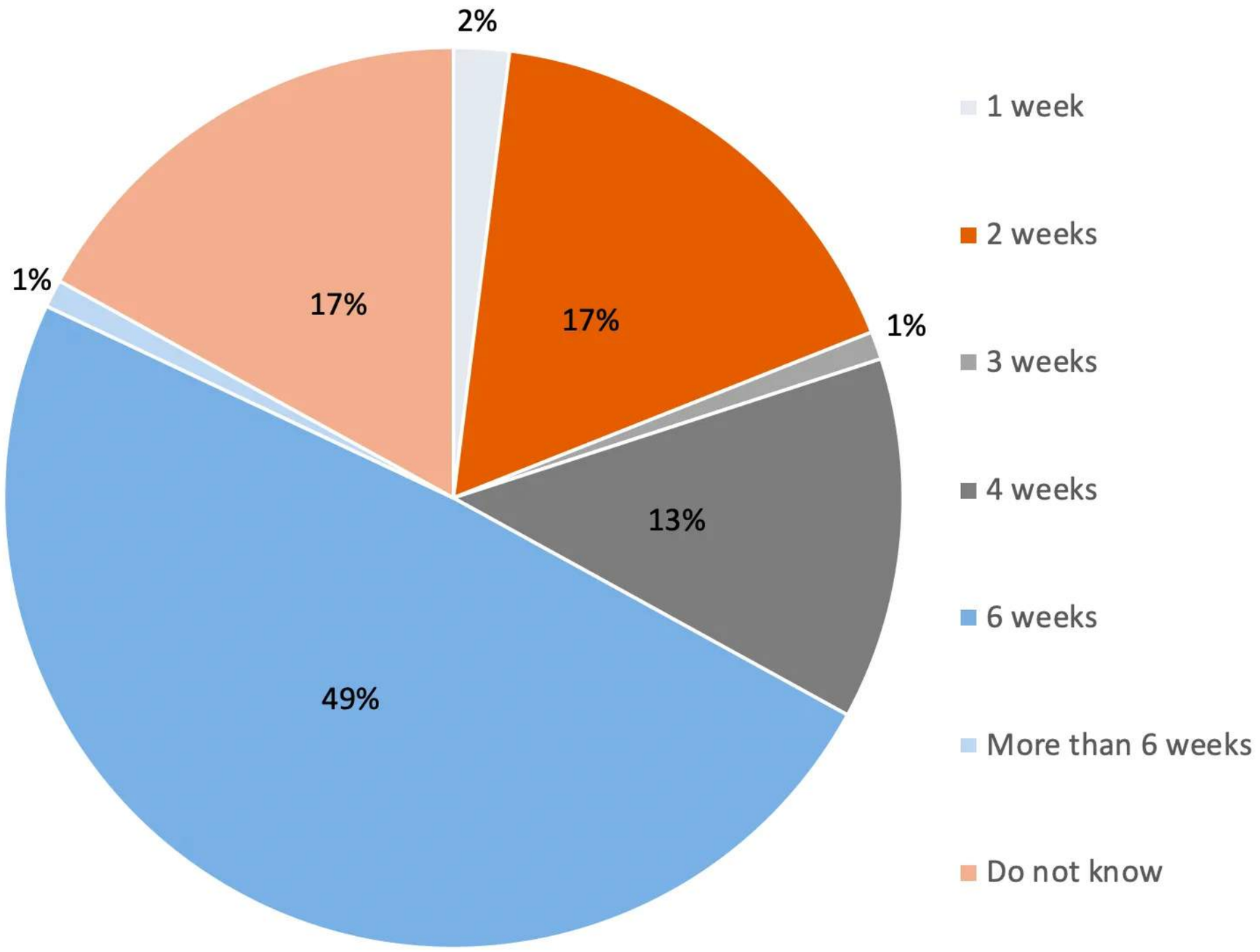
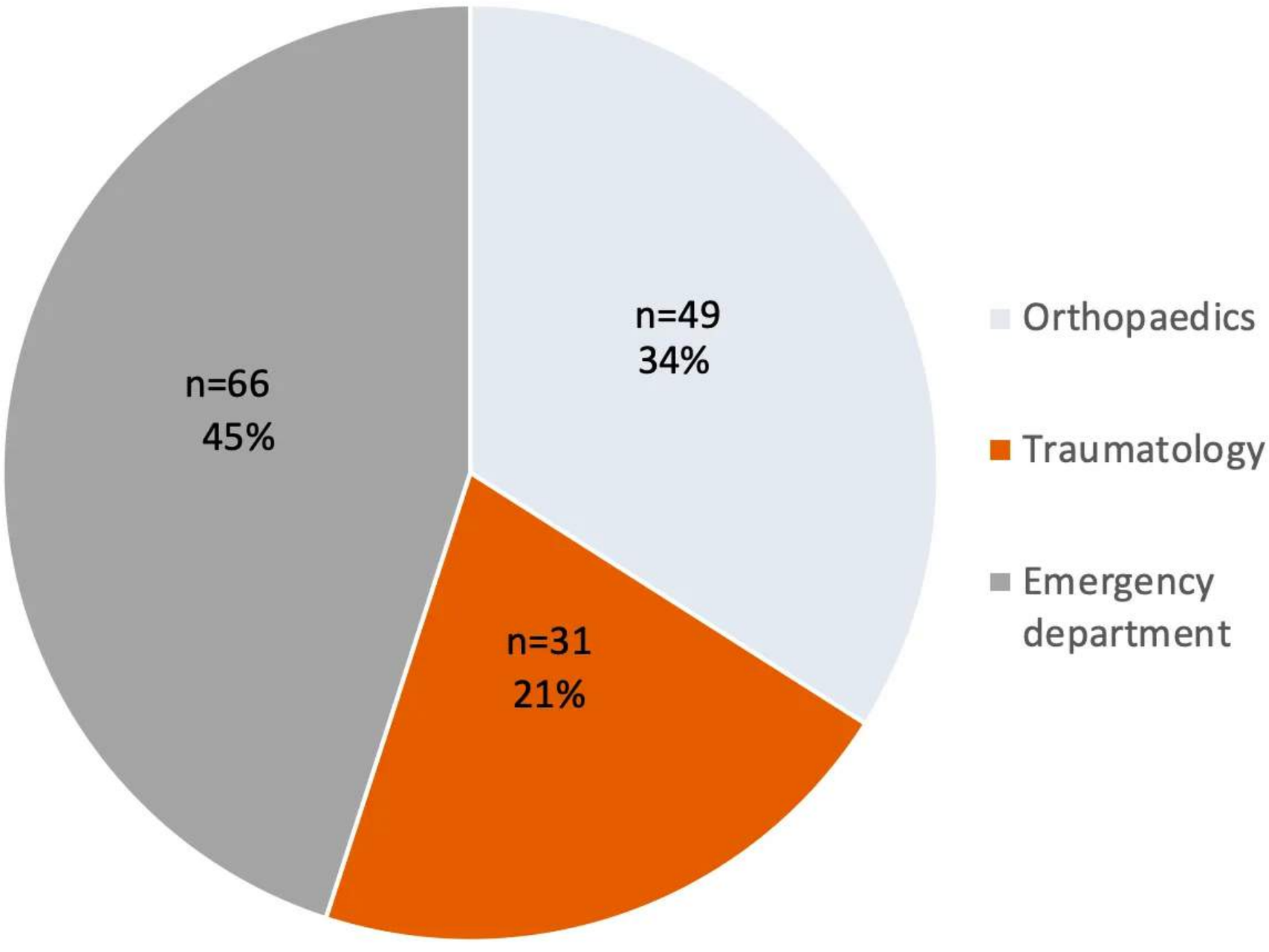


fig1-3

Figure 1. Distribution of the departments of the respondents



addendum-2

Addendum 1 - Pubmed Search strategy of the present study

(("supracondylar humerus fracture"[tw] OR "supracondylar humerus fractures"[tw] OR "supracondylar humeral fracture"[tw] OR "supracondylar humeral fractures"[tw] OR (("Humeral Fractures"[Mesh] OR "humerus fracture"[tw] OR "humerus fractures"[tw] OR "humeral fracture"[tw] OR "humeral fractures"[tw])

AND ("supracondylar"[tw] OR supracondyl*[tw])) OR supracondyl*[tw])

AND ("Night Care"[mesh] OR "night"[tw] OR "nights"[tw] OR "nighttime"[tw] OR "night time"[tw] OR night*[tw] OR "overtime"[tw] OR "after-hours"[tw] OR "Sleep Deprivation"[mesh] OR "Shift Work Schedule"[mesh] OR "office hours"[tw] OR "daytime"[tw] OR nocturnal*[tw])

AND ("child"[tw] OR "Child"[Mesh] OR "child"[tw] OR "children"[tw] OR "Infant"[Mesh] OR "infant"[tw] OR "infants"[tw] OR "infancy"[tw] OR "newborn"[tw] OR "newborns"[tw] OR "new-born"[tw] OR "new-borns"[tw] OR "neonate"[tw] OR "neonates"[tw] OR "neonatal"[tw] OR "neo-nate"[tw] OR "neo-nates"[tw] OR "neo-natal"[tw] OR "neonatology"[tw] OR "NICU"[tw] OR "premature"[tw] OR "prematures"[tw] OR "pre-mature"[tw] OR "pre-matures"[tw] OR "preterm"[tw] OR "pre-term"[tw] OR "postnatal"[tw] OR "post-natal"[tw] OR "baby"[tw] OR "babies"[tw] OR "suckling"[tw] OR "sucklings"[tw] OR "toddler"[tw] OR "toddlers"[tw] OR "childhood"[tw] OR "schoolchild"[tw] OR "schoolchildren"[tw] OR "childcare"[tw] OR "child-care"[tw] OR "young"[tw] OR "youngster"[tw] OR "youngsters"[tw] OR "preschool"[tw] OR "pre-school"[tw] OR "kid"[tw] OR "kids"[tw] OR "boy"[tw] OR "boys"[tw] OR "girl"[tw] OR "girls"[tw] OR "Adolescent"[Mesh] OR "adolescent"[tw] OR "adolescents"[tw] OR "adolescence"[tw] OR "pre-adolescent"[tw] OR "pre-adolescents"[tw] OR "pre-adolescence"[tw] OR "schoolage"[tw] OR "schoolboy"[tw] OR "schoolboys"[tw] OR "schoolgirl"[tw] OR "schoolgirls"[tw] OR "pre-puber"[tw] OR "pre-pubers"[tw] OR "pre-puberty"[tw] OR "prepuber"[tw] OR "prepubers"[tw] OR "prepuberty"[tw] OR "puber"[tw] OR "pubers"[tw] OR "puberty"[tw] OR "puberal"[tw] OR "teenager"[tw] OR "teenagers"[tw] OR "teens"[tw] OR "youth"[tw] OR "youths"[tw] OR "underaged"[tw] OR "under-aged"[tw] OR "Pediatrics"[Mesh] OR "Pediatric"[tw] OR "Pediatrics"[tw] OR "Paediatric"[tw] OR "Paediatrics"[tw] OR "PICU"[tw] OR ("child"[all fields] NOT child[au]) OR children*[all fields] OR schoolchild*[all fields] OR "infant"[all fields] OR "infants"[all fields] OR "infancy"[all fields] OR adolesc*[all fields] OR pediat*[all fields] OR paediat*[all fields] OR neonat*[all fields] OR toddler*[all fields] OR "teen"[all fields] OR "teens"[all fields] OR teenager*[all fields] OR preteen*[all fields] OR newborn*[all fields] OR postneonat*[all fields] OR postnatal*[all fields] OR "puberty"[all fields] OR preschool*[all fields] OR suckling*[all fields] OR "juvenile"[all fields] OR "new born"[all fields] OR "new borns"[all fields] OR new-born*[all fields] OR neo-nat*[all fields] OR neonat*[all fields] OR perinat*[all fields] OR underag*[all fields] OR "under age"[all fields] OR "under aged"[all fields] OR youth*[all fields] OR pubescen*[all fields] OR prepubescen*[all fields] OR "prepuberty"[all fields] OR "school age"[all fields] OR "schoolage"[all fields] OR "school ages"[all fields] OR schoolage*[all fields] OR "one year old"[tw] OR "two year old"[tw] OR "three year old"[tw] OR "four year old"[tw] OR "five year old"[tw] OR "six year old"[tw] OR "seven year old"[tw] OR "eight year old"[tw] OR "nine year old"[tw] OR "ten year old"[tw] OR "eleven year old"[tw] OR "twelve year old"[tw] OR "thirteen year old"[tw] OR "fourteen year old"[tw] OR "fifteen year old"[tw] OR "sixteen year old"[tw] OR "seventeen year old"[tw] OR "eighteen year old"[tw] OR "1 year old"[tw] OR "2 year old"[tw] OR "3 year old"[tw] OR "4 year old"[tw] OR "5 year old"[tw] OR "6 year old"[tw] OR "7 year old"[tw] OR "8 year old"[tw] OR "9 year old"[tw] OR "10 year old"[tw] OR "11 year old"[tw] OR "12 year old"[tw] OR "13 year old"[tw] OR "14 year old"[tw] OR "15 year old"[tw] OR "16 year old"[tw] OR "17 year old"[tw] OR "18 year old"[tw] OR "two years old"[tw] OR "three years old"[tw] OR "four years old"[tw] OR "five years old"[tw] OR "six years old"[tw] OR "seven years old"[tw] OR "eight years old"[tw] OR "nine years old"[tw] OR "ten years old"[tw] OR "eleven years old"[tw] OR "twelve years old"[tw] OR "thirteen years old"[tw] OR "fourteen years old"[tw] OR "fifteen years old"[tw] OR "sixteen years old"[tw] OR "seventeen years old"[tw] OR "eighteen years old"[tw] OR "2 years old"[tw] OR "3 years old"[tw] OR "4 years old"[tw] OR "5 years old"[tw] OR "6 years old"[tw] OR "7 years old"[tw] OR "8 years old"[tw] OR "9 years old"[tw] OR "10 years old"[tw] OR "11 years old"[tw] OR "12 years old"[tw] OR "13 years old"[tw] OR "14 years old"[tw] OR "15 years old"[tw] OR "16 years old"[tw] OR "17 years old"[tw] OR "18 years old"[tw]))

Addendum 2 - The PRISMA citeria.

PRISMA 2009 Checklist (Adapted for KIN 4400)

Section/topic	#	Checklist item	Reported on page #
TITLE			
	1	Identify the report as a literature review.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings;	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known about your topic.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Eligibility criteria	5	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	6	Describe all information sources (e.g., databases with dates of coverage) in the search and date last searched.	
Search	7	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	8	State the process for selecting studies (i.e., screening, eligibility).	
Risk of bias in individual studies	9	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level).	
Risk of bias across studies	10	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
RESULTS			
Study selection	11	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	
Study characteristics	12	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	
Synthesis of results of individual studies	13	For all outcomes considered (benefits or harms), present, for each study: (a) summary of results and (b) relationship to other studies under review (e.g. agreements or disagreements in methods, sampling, data collection or findings).	
DISCUSSION			
Summary of evidence	14	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	
Limitations	15	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	
CONCLUSION			
Conclusions	16	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	

Adapted from: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA statement. PLoS Medicine, 6(6), e1000097. doi:10.1371/journal.pmed1000097

For more information, visit: www.prisma-statement.org.

Artikel-5-table-2

Table 2, PRO results	Pre COVID-19 lockdown (n=73)	Re-start elective surgery (n=43)	p
Pain at rest, mean (SD)[1]			
All	5.5 (2.7)	5.2 (2.4)	0.46
THA	5.2 (2.5)	5.4 (2.6)	0.68
TKA	6.6 (1.8)	4.9 (2.1)	0.05
Pain during activity, mean (SD)[1]			
All	7.5 (2.1)	7.3 (2.2)	0.66
THA	6.1 (3.6)	7.3 (2.5)	0.81
TKA	7.9 (0.9)	7.2 (1.8)	0.13
EQ-5D index score, mean (SD)[2]			
All	0.64 (0.18)	0.47 (0.23)	0.00
THA	0.64 (0.17)	0.47 (0.24)	0.00
TKA	0.62 (0.23)	0.64 (0.19)	0.59
HOOS-PS/KOOS-PS, mean (SD)[3]			
THA	46.0 (18.1)	49.8 (20.7)	0.32
TKA	53.8 (11.9)	48.3 (12.7)	0.10
OHS/OKS, mean (SD)[4]			
THA	24.0 (8.7)	19.7 (9.7)	0.01
TKA	24.7 (6.1)	27.7 (8.3)	0.06

[1]: measured using a NRS score, with 0 meaning “no pain at all” and 10 meaning “worst imaginable pain”;

[2]: EQ-5D index score Dutch dataset ranging from -0.329 (worst possible health) to 1 (best possible health);

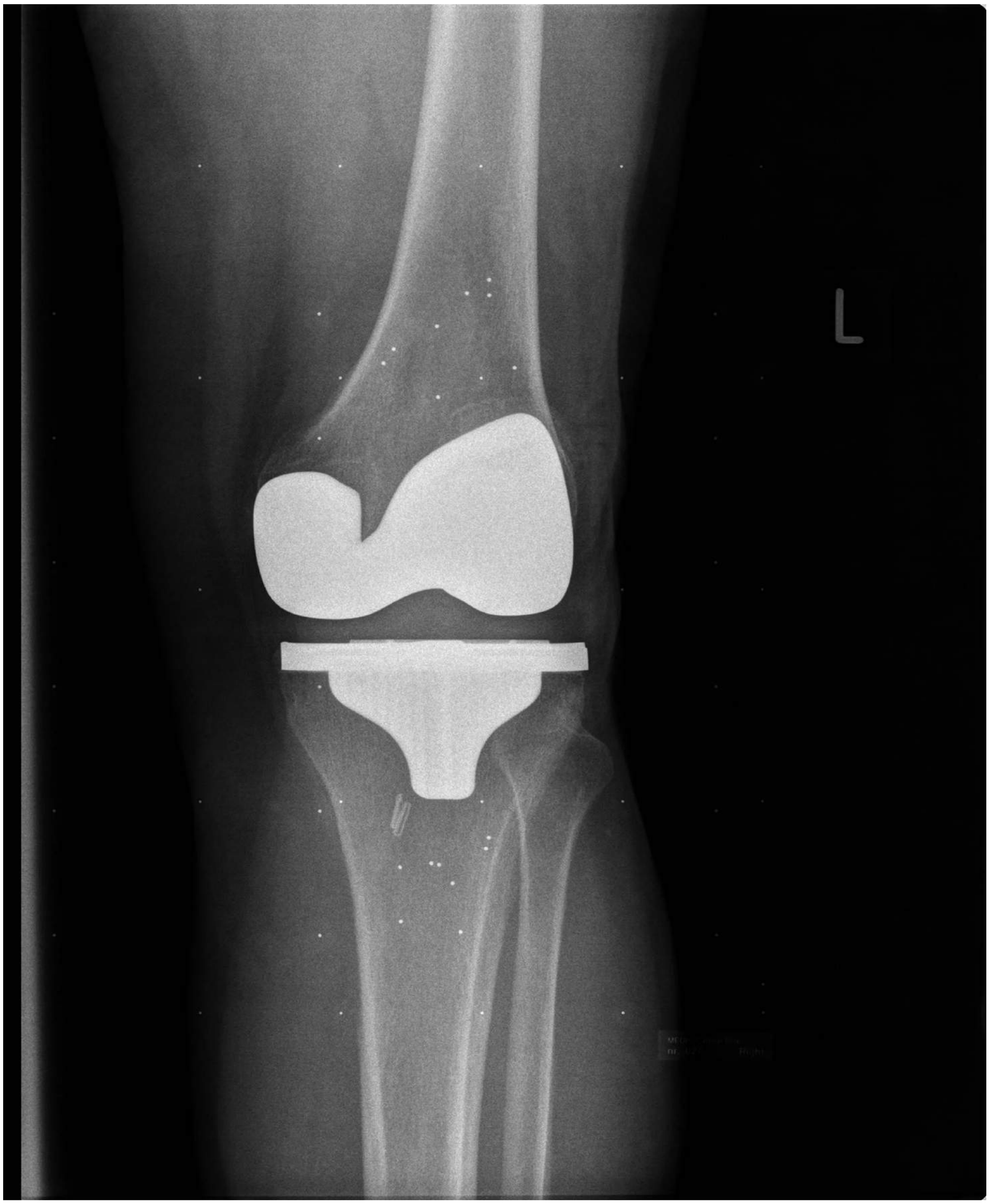
[3]: KOOS-PS and KOOS-PS scores range from 0 (no difficulty) to 100 (extreme difficulty);

[4]: OKS and OHS scores range from 0 (worst) to 48 (best)). SD = Standard deviation.

Artikel-5-table-1

Table 1, Patient demographics and results	All (n=88)	Hip (n=31)	Knee (n=57)
Male/Female (n)	45/43	15/16	30/27
Age (mean, min-max)	69.5 (51.2-87.8)	70.2 (56.0-85.6)	69.2 (51.2-87.8)

fig-1-artikel-5



artikel-5-fig-2

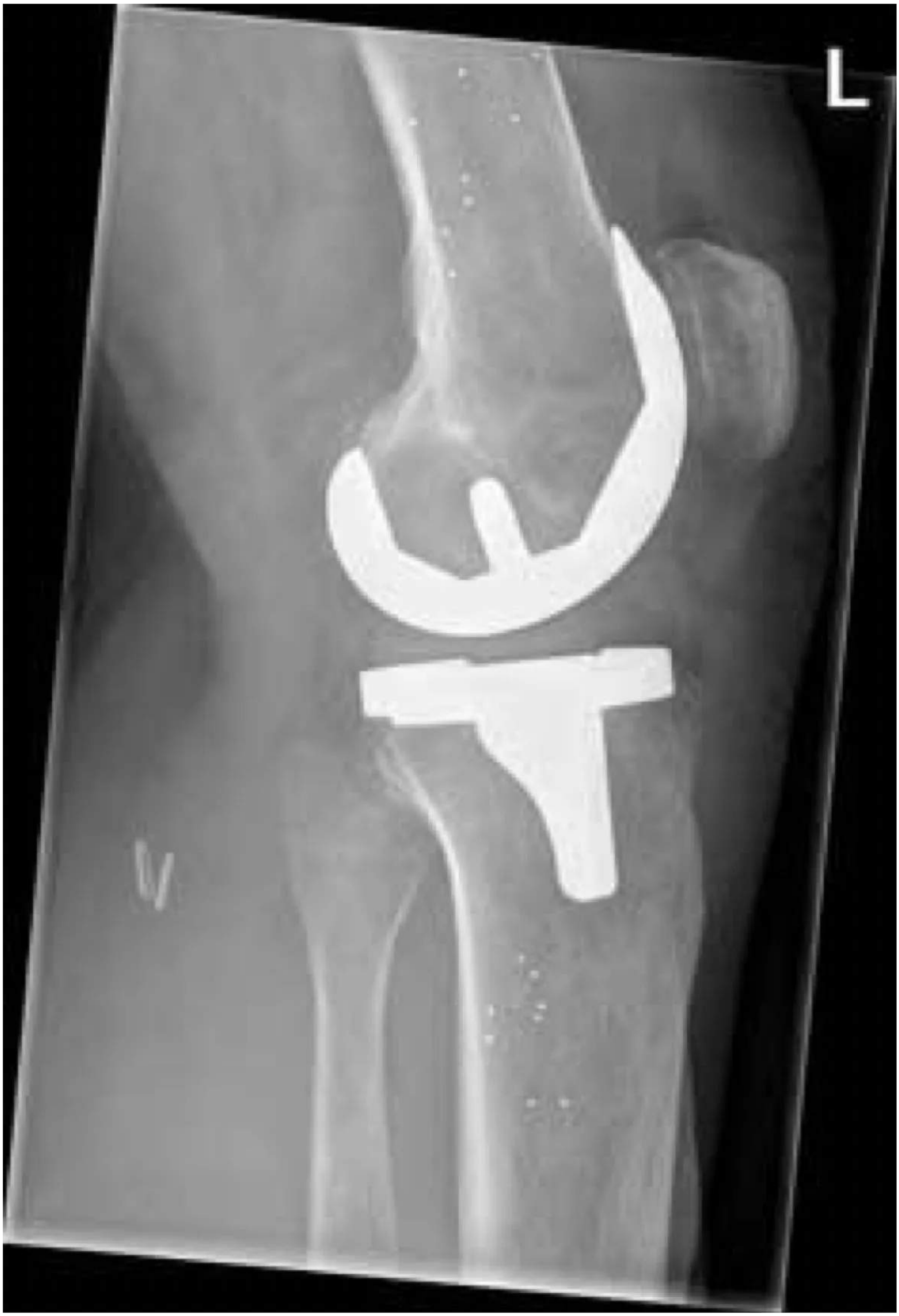


table-1-article-4

Table 1. Outcomes and results of the articles included.

	Amount of patients in office hours group	Amount of patients in after-hours group	Primary outcome	Secondary outcomes	Primary result	Secondary results
Aydogmus et al.[7] 2017	47	44	poor fixation	surgical method, placement of any medial pins, operation time, any postoperative neurovascular complication, successful reduction rate, successful fixation rate, any induced deformity, and rate of loss of function	Significantly more poor fixation in the after-hours group vs the office hours-group (4/47 (9%) vs 17/44 (39%) (p=0.005))	No significant differences between any of the groups
Paci et al.[10] 2018	77	186	malunion	surgeon subspecialty, operative duration, range of motion, carrying angle, and other clinical outcomes.	No significant difference in malunion, but more in the "night" subgroup vs the "all groups but night" group (2/26 (8%) vs 2/236, 1%) (p=0.05))	No significant differences between any of the groups
Balakumar et al.[11] 2012	37	40	loss of reduction	number of pins used, and technical quality of pinning	No significant difference in loss of reduction in the office hours group vs the after-hours group (7/37, (19%) vs 7/40, (18%) p=1.00)	No significant differences between any of the groups

table-1-articel-4

	Amount of patients in office hours group	Amount of patients in after-hours group	Primary outcome	Secondary outcomes	Primary result	Secondary results
Aydogmus et al.[7] 2017	47	44	poor fixation	surgical method, placement of any medial pins, operation time, any postoperative neurovascular complication, successful reduction rate, successful fixation rate, any induced deformity, and rate of loss of function	Significantly more poor fixation in the after-hours group vs the office hours-group (4/47 (9%) vs 17/44 (39%) (p=0.005))	No significant differences between any of the groups
Paci et al.[10] 2018	77	186	malunion	surgeon subspecialty, operative duration, range of motion, carrying angle, and other clinical outcomes.	No significant difference in malunion, but more in the "night" subgroup vs the "all groups but night" group (2/26 (8%) vs 2/236, 1%) (p=0.05))	No significant differences between any of the groups
Balakumar et al.[11] 2012	37	40	loss of reduction	number of pins used, and technical quality of pinning	No significant difference in loss of reduction in the office hours group vs the after-hours group (7/37, (19%) vs 7/40, (18%) p=1.00)	No significant differences between any of the groups