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An Uncommon Complication: Common Peroneal Nerve Palsy After Medial TKA

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Abstract

Common peroneal nerve palsy (CPNP) is an uncommon but potentially disabling complication following total knee arthroplasty (TKA). Most cases are associated with severe valgus deformity or extensive lateral releases; however, we encountered a rare presentation following a medial parapatellar approach in a neutral knee.

In this report, we present the case of a 55-year-old female with bilateral knee osteoarthritis and a BMI of 52.09 who underwent simultaneous bilateral TKA. The procedure was uneventful, and she was discharged the same day without neurological deficits. Shortly thereafter, she developed progressive right-sided foot drop, which prompted evaluation two months postoperatively. Examination revealed dense right foot drop with sensory loss below the knee. Needle electromyography (EMG) confirmed severe common peroneal neuropathy, in which we initiated conservative management with an ankle-foot orthosis (AFO), structured physical therapy, and serial EMG monitoring. Over the following months, the patient demonstrated steady neurological recovery, culminating in near-complete functional improvement at 11 months.

This case highlights that CPNP can occur even without valgus deformity or lateral surgical exposure. Recognizing risk factors, especially morbid obesity, combined with early diagnosis, structured rehabilitation, and close follow-up, can lead to excellent outcomes.

Keywords: Total knee arthroplasty; Common peroneal nerve palsy; Medial parapatellar approach; Obesity; Foot drop

Introduction

Common peroneal nerve palsy (CPNP) is a rare but significant complication after total knee arthroplasty (TKA), with reported incidences ranging from 0.12% to 0.4% [1-4]. It is most commonly associated with valgus deformity, extensive lateral releases, and revision procedures. However, it is important to recognize that CPNP can also occur in the absence of these risk factors, and its occurrence in neutral-aligned knees undergoing a medial parapatellar approach remains underreported. In this report, we present a unique case of severe CPNP following TKA in a morbidly obese patient with neutral preoperative alignment. Our goal is to describe the patient's clinical course, discuss potential mechanisms of injury, and review diagnostic and management strategies to improve recognition and treatment of this uncommon but challenging complication.

Case Presentation

In June 2023, a 55-year-old female with bilateral knee osteoarthritis and a BMI of 52.09 presented for evaluation and surgical management. After discussing treatment options, we proceeded with simultaneous bilateral TKA using a medial parapatellar approach. Standard bone cuts were performed, trial components were placed, and stable extension and flexion gaps were confirmed intraoperatively, and final implants were then cemented in place. The procedure was uncomplicated, and the knees were stable throughout the range of motion at closure. Pre and post-procedure films are shown (Figure 1 and 2). She was discharged the same day without neurological deficits.

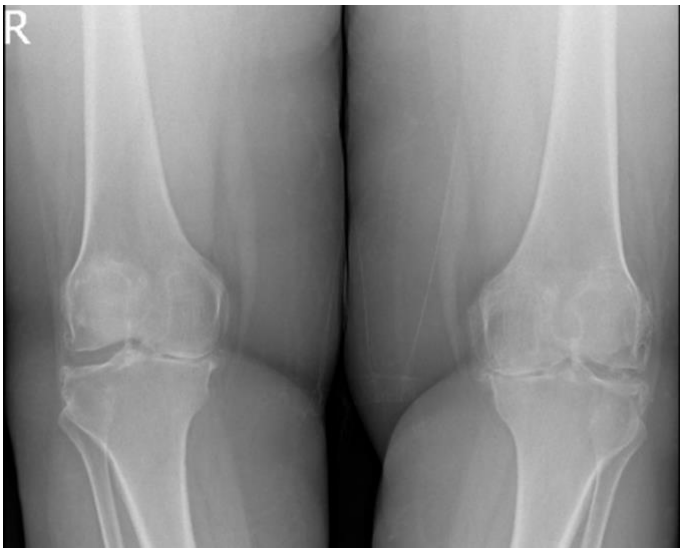

Figure 1: Pre-operative AP radiograph of bilateral knees showing sclerotic changes and medial joint space narrowing.

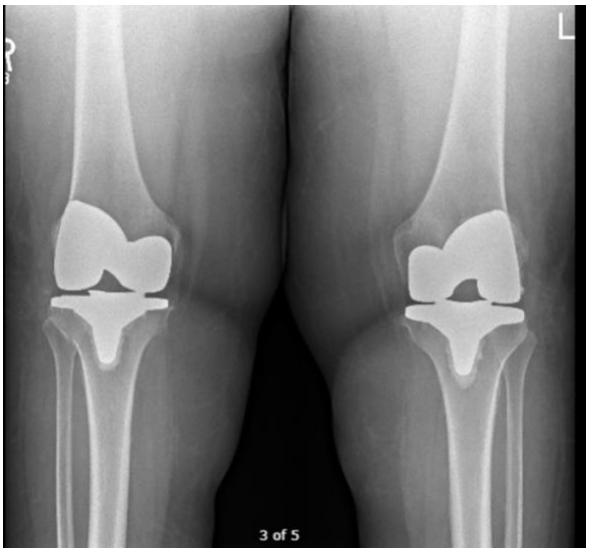

Figure 2: Post-operative AP radiograph showing bilateral cemented total knee arthroplasties with well-aligned femoral and tibial components.

Two months later, the patient returned to the clinic reporting a persistent right-sided foot drop that began shortly after surgery. She initially dismissed the symptoms but became concerned after noticing her foot dragging and progressive difficulty ambulating. On examination, she had dense right foot drop, decreased sensation below the knee, and complete loss of ankle dorsiflexion, while plantarflexion strength was preserved. Examination of the left lower extremity was unremarkable. EMG confirmed severe common peroneal neuropathy on the right side, showing absent motor responses at the ankle, fibular head, and popliteal fossa, along with absent superficial fibular sensory responses. Based on these findings, she was clinically diagnosed with severe CPNP in which we initiated conservative management, including a rigid AFO, intensive physical therapy, and close follow-up.

At her four-month postoperative visit, the patient reported partial recovery of dorsiflexion strength and improved sensation around the foot. A repeat EMG demonstrated interval improvement, with compound motor action potentials (CMAPs) now present in the deep and common peroneal nerves, although conduction velocities remained reduced and superficial fibular sensory responses were still absent. In the interval, the patient reported that she thought physical therapy sessions were helping her regain sensation and function with noticeable differences at this point.

By her final follow-up at 11 months, the patient demonstrated near-complete recovery. She reported full return of ankle dorsiflexion and discontinued the AFO three months prior. Physical examination confirmed stable dorsiflexion strength, with only mild residual weakness in ankle eversion and persistent but functionally insignificant numbness along the lateral leg. She was ambulating independently without assistive devices and remained highly satisfied with her outcome at final follow up.

Discussion

Although rare, common peroneal nerve palsy after TKA represents a challenging complication due to its functional impact and uncertain prognosis. Most cases occur in patients with predisposing risk factors, particularly severe valgus deformity, where lateral soft-tissue tightness and extensive releases increase tension on the peroneal nerve [5,6]. Reported incidence rates in valgus knees are as high as 3% to 4%, compared to less than 0.3% in neutral or varus knees [3,4,7]. In contrast, our patient developed CPNP despite neutral alignment and a medial parapatellar approach, highlighting the need to consider additional contributing factors.

Several mechanisms may have contributed to this patient's presentation. First, her morbid obesity (BMI 52.09) may have increased risk of soft-tissue tension and localized compartmental pressures, placing the peroneal nerve at risk of ischemic injury. Defined as a BMI over 35, her BMI exceeded 40, indicating a heightened risk for overall morbidity, postoperative infections, stroke, and readmission. Interestingly, Agarwala et al. examined 402 knees in 213 patients with BMIs ranging from 30 to 39.99 and found no statistical difference between the complication rates of obese patients and non-obese patients [8]. Additionally, the complications did not account for nerve injury or foot drop among the complications (post-op pain, wound infection, deep vein thrombosis, delayed wound healing). Since obesity is a potential risk factor of CPNP following TKA in which the literature does not agree, further studies would aid in comprehension of this mechanism [9,10].

Intraoperative factors such as lateral retractor placement or subtle traction during exposure could have contributed to the patient's nerve injury, even without correction of a natively valgus knee. Forceful retraction or malpositioned retraction may have caused shearing or compression of the common peroneal nerve (CPN) during the procedure. This mechanism is recognized in knee surgeries; however, the incidence of CPN palsy specifically associated with the medial parapatellar approach in total knee arthroplasty (TKA) has not been well quantified in the literature [11]. Anatomical studies demonstrate that the CPN courses near the posterolateral structures of the knee, lying at a mean distance of around 12 mm from the posterolateral capsule, placing it at risk during surgical exposure and retractor placement [12].

Rapid weight loss is an infrequent but reported independent risk factor for the development of CPN palsy, a phenomenon referred to as "slimmer's paralysis." This occurs due to the loss of protective adipose tissue surrounding the fibular head, making the nerve more susceptible to compression and irritation [13]. However, in our patient's case, there was no evidence of rapid weight loss, and she remained weight stable throughout the preoperative period leading up to her surgery.

Electromyography played an important role in determining prognosis for this patient. The presence of early reinnervation potentials suggested partial axonal injury rather than complete transection, predicting a favorable recovery trajectory. Axonotmesis, or disruption of the axons with preservation of the connective tissue of the nerve, allows for axonal regeneration and reinnervation of muscles. Early reinnervation potentials on EMG indicate that axonal continuity is at least partially preserved, and that axonal regrowth is occurring, which is characteristic of axonotmesis rather than neurotmesis (complete transection) [14,15]. Serial EMG studies were valuable for monitoring nerve function and guiding expectations, especially since clinical improvements lagged behind electrophysiological changes.

The management of CPNP after total knee arthroplasty depends on the severity of injury and the rate of recovery. Most incomplete peroneal nerve injuries, typically neuropraxia or axonotmesis with early signs of reinnervation, have a favorable prognosis and often recover spontaneously over time. Early reinnervation potentials on EMG indicate that axonal continuity is at least partially preserved, and that axonal regrowth is occurring, characteristic of axonotmesis or neuropraxia rather than neurotmesis (complete transection) [14,15].

First-line management, as implemented in our patient, involves conservative measures that focus on maintaining joint range of motion, preventing contractures, and supporting gait during recovery. This is achieved through physical therapy and the use of AFOs to reduce falling/tripping. Physical therapy plays a particularly important role in patients with incomplete palsy, with published data showing that up to 75% of patients with neuropraxia or axonotmesis who undergo conservative management achieve full recovery [2,10,16].

Surgical intervention is considered when there is no clinical or electrophysiological improvement after three to six months of nonoperative management or when a compressive lesion is suspected. In such cases, external neurolysis (surgical decompression) of the common peroneal nerve at the fibular head has demonstrated favorable outcomes, even when performed weeks to months after injury. Studies report functional improvement in 74% to 97% of cases and complete recovery in 54% to 69% of patients, particularly when decompression is performed within 12 months of symptom onset [17-19].
In rare cases of nerve transection or severe axonal loss, more advanced techniques such as direct nerve repair, nerve grafting, or nerve transfers may be considered, although these are uncommon in the TKA setting [20,21]. Fortunately, our patient responded well to conservative management, demonstrating gradual improvement and ultimately regaining near-complete function without requiring surgical intervention.

Conclusion

Common peroneal nerve palsy is an uncommon but functionally significant complication following total knee arthroplasty. While most cases are associated with severe valgus deformity or extensive lateral releases, this report highlights that CPNP can occur even in neutral-aligned knees undergoing a medial parapatellar approach. Intraoperative factors, such as retractor placement or traction, may contribute to increased vulnerability of the nerve, even in the absence of traditional risk factors. Our patient's near-complete neurological improvement underscores the importance of individualized care and demonstrates that excellent outcomes are achievable without surgical intervention when appropriate diagnosis and management are implemented early.

Learning Point of the Article

Common peroneal nerve palsy can occur after total knee arthroplasty performed through a medial parapatellar approach, even in the absence of valgus deformity, and morbid obesity may be an independent risk factor.

Clinical Message

CPNP can occur even after TKA in neutral-aligned knees using a medial parapatellar approach. Recognizing risk factors, initiating early conservative management, and closely monitoring nerve recovery are key to optimizing outcomes.

REFERENCES

1. Jayaram RH, Kim L, Day W, et al. Risk factors for perioperative nerve injury associated with total knee arthroplasty: analysis of a national administrative database. PLoS One. 2025; 20: 0324527.
2. Speelziek SJA, Staff NP, Johnson RL, et al. Clinical spectrum of neuropathy after primary total knee arthroplasty: a series of 54 cases. Muscle Nerve. 2019; 59: 679-682.
3. Christ AB, Chiu YF, Joseph A, et al. Incidence and risk factors for peripheral nerve injury after 383,000 total knee arthroplasties using a New York State database (SPARCS). J Arthroplasty. 2019; 34: 2473-2478.
4. Johnson DB, Marfo KA, Zochowski CG, et al. Acute common peroneal nerve decompression after total knee arthroplasty. Orthopedics. 2021; 44: 556-562.
5. Krackow KA, Maar DC, Mont MA, et al. Surgical decompression for peroneal nerve palsy after total knee arthroplasty. Clin Orthop Relat Res. 1993; 292: 223-229.
6. Bruzzone M, Ranawat A, Castoldi F, et al. The risk of direct peroneal nerve injury using the Ranawat "Inside-Out" lateral release technique in valgus total knee arthroplasty. J Arthroplasty. 2010; 25: 161-165.
7. Idusuyi OB, Morrey BF. Peroneal nerve palsy after total knee arthroplasty: assessment of predisposing and prognostic factors. J Bone Joint Surg Am. 1996; 78: 177-184.
8. Agarwala S, Jadia C, Vijayvargiya M. Is obesity a contraindication for successful total knee arthroplasty? J Clin Orthop Trauma. 2020; 11: 136-139.
9. Høvik Ø, Jenssen KK, Amlie E, et al. Peroneal nerve palsy after total knee arthroplasty. Arthroplasty Today. 2024; 10: 101331.
10. Park JH, Restrepo C, Norton R, et al. Common peroneal nerve palsy following total knee arthroplasty: prognostic factors and course of recovery. J Arthroplasty. 2013; 28: 1538-1542.
11. Patel NK, Krumme J, Golladay GJ. Incidence, injury mechanisms, and recovery of iatrogenic nerve injuries during hip and knee arthroplasty. J Am Acad Orthop Surg. 2021; 29: 940-949.
12. Jenkins MJ, Farhat M, Hwang P, et al. The distance of the common peroneal nerve to the posterolateral structures of the knee. J Arthroplasty. 2016; 31: 2907-2911.
13. Cucu LE, Popescu G, Maștaleru A, et al. Common peroneal nerve paralysis following rapid weight loss: a case report and literature review. Nutrients. 2025; 17: 1782.
14. Robinson LR. Traumatic injury to peripheral nerves. Muscle Nerve. 2022; 66: 661-670.
15. Robinson LR. Predicting recovery from peripheral nerve trauma. Phys Med Rehabil Clin N Am. 2018; 29: 721-733.

16. Schinsky MF, Macaulay W, Parks ML, et al. Nerve injury after primary total knee arthroplasty. J Arthroplasty. 2001; 16: 1048-1054.
17. Chow AL, Levidy MF, Luthringer M, et al. Clinical outcomes after neurolysis for the treatment of peroneal nerve palsy: a systematic review and meta-analysis. Ann Plast Surg. 2021; 87: 316-323.
18. Wilson C, Yaacoub AP, Bakare A, et al. Peroneal nerve decompression: institutional review and meta-analysis to identify prognostic associations with favorable and unfavorable surgical outcomes. J Neurosurg Spine. 2019; 30: 714-721.
19. Mont MA, Dellon AL, Chen F, et al. The operative treatment of peroneal nerve palsy. J Bone Joint Surg Am. 1996; 78: 863-869.
20. Klifto KM, Azoury SC, Gurno CF, et al. Treatment approach to isolated common peroneal nerve palsy by mechanism of injury: systematic review and meta-analysis of individual participant data. J Neurosurg Spine. 2021; 34: 110-123.
21. Carlson SC, Dittman LE, Spinner RJ, et al. Surgical Management of Peroneal Nerve Injuries. Acta Neurochirurgica. 2023; 165: 2573-2580.