Case report of two instances of recurrent dislocations with constrained hinged knee prosthesis

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'I (and/or my coauthors) have nothing to disclose'

Purpose

To discuss two rare cases of dislocations in patients with hinged knee prostheses

Introduction

- Constrained total knee arthroplasty (TKA) systems used for significant knee deformities, insufficiency of collaterals, tumor cases
- Dislocations very rare with few examples in literature

Case 1

- 56-year-old male ex-smoker PMHx depression, asthma, HTN, OSA, complicated Orthopedic history
- Primary right TKA for OA complicated by quadriceps tendon rupture necessitating patella repair and ultimately revision TKA
- H. influenza positive prosthetic joint infection status post irrigation and debridement and staged revision with NexGen antibiotic cemembed TKA.
- Extension lag status post quadriceps repair with Arthrex repair system
- Draining sinus and aspiration positive for S. aureus status post explant and antibiotic spacer placement, systemic IV antibiotics

Case 1

- After 3 months of IV antibiotics, underwent explant and revision TKA with Zimmer Revision System [NexGen] and antibiotic bead placement.
- Atraumatic dislocation nine months later closed reduced at bedside
- Multiple additional dislocations self reduced
- Development of multiple seromas about knee requiring drainage, embolization, gastrocnemius flap coverage
- Developed popliteal deep vein thrombosis, started on Eliquis developed right lower extremity hematoma with concerns for compartment syndrome status post four compartment fasciotomies, closed reduction after found to have jumped post
- 5 months ago underwent right total knee arthroplasty explantation revision with quadriceps tendon repair

Figure 1: lateral and AP views of right periprosthetic hinged knee arthroplasty dislocation

Figure 2: lateral and AP views of right periprosthetic hinged knee arthroplasty status post explantation, and revision

Case 2

- 70-year-old male PMH OSA, BPH, TIA
- Primary right TKA 5 years prior,
- Revision right TKA 2.5 years ago after fall from height
- S. epidermidis right knee PJI 1 year ago leading to loosening of components
- Distal femur replacement with distal femoral limb preservation system (LPS), MBT tibial tray and tobramycin cement with radical synovectomy
- Vancomycin and Rifampin → Doxycyclin x 6 months
- 1 month later dislocated femoral component and periprosthetic proximal tibia fracture s/p I&D, reconstruction extensor mechanism, antibiotic bead placement, proximal tibial ORIF
- Long leg cast x 6 weeks
- Hinged knee brace locked in extension
- 4 months later right TKA dislocation while standing up
- I&D, poly swap of distal femoral replacement and open reduction of DFR with MRSA and CoNS positive cultures
- 4.5 months of antibiotics and indefinite suppression
- DVT while on lovenox, transitioned to apixaban
- Continue hinged knee brace to prevent dislocations

Figure 3: lateral and AP views of right periprosthetic hinged knee arthroplasty dislocation

Figure 4: lateral and AP views of tib/fib with periprosthetic tibial shaft fracture

Discussion

Multiple factors contribute to failure of TKA revision

- Infection, stiffness, extensor mechanism problems, fracture, aseptic loosening, hematoma, misalignment/malpositioning, and instability
    - Infection leading cause of re-revision
- First case
    - numerous prior infections with multiple negative aspirations prior to re-revision
    - Morbid obesity
    - Extensor mechanism injury
    - Discussion of arthrodesis vs locked hinged knee revision arthroplasty
- Second case
    - Chronic PJI
    - Discussion of above knee amputation

Conclusion

The leading causes of dislocated hinge knee system include:
- A heavy leg in obese patients
- Gross shortening during surgery
- Dysfunctional/absent extensor mechanism
- Breakage of components
- Lack of locking mechanism