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Case report

Treatment of late Patella Baja after an otherwise routine total knee arthroplasty☆,☆☆

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ABSTRACT

There is very little data on the incidence or treatment options for late developing patella baja following uncomplicated total knee arthroplasty (TKA). In this article we present the course, surgical treatment, rationale, and one-year outcome of our treatment of this complication with extensor mechanism allograft reconstruction. In our patient, the index TKA produced good results in the early postoperative period, but the patient went on to develop pain, decreased range of motion (ROM), and patella baja, which was resistant to extensive physical therapy and MUA. This was treated successfully with an extensor mechanism allograft, which restored normal patellar height relationships.

1. Case

This is an otherwise healthy 56-year-old female who had TKA done for osteoarthritis by a high-volume adult-reconstructive surgeon. Implants used at primary TKA were posterior-stabilized Zimmer Nexgen (Warsaw, IN.) cemented femoral and tibial components. A standard distal femoral resection was made, and the joint line was not altered. Her initial postoperative course was uncomplicated, and she was discharged to home on post-operative day two with home services and PT as per our usual routine. She did well in the short term, achieved full extension, with flexion to 110° at six weeks postop. At that time, she was satisfied with her motion and pain relief from surgery. Preop and immediate postoperative films are shown in Figures 1 and 2.

At her three-month postop visit to the office, she came in complaining of a dull achiness in the knee and progressive decreasing flexion. At that point, ROM was 0–60° and she was treated with manipulation under anesthesia (MUA). She regained an active ROM of 0–110°.

Then at three months post-manipulation, knee flexion had decreased to 60° again and X-rays seen in Figure 3 demonstrated patella baja not evident on postop films. Physical therapy was reinstated for six months with no improvement in ROM. Figures 4 and 5 demonstrate progression of her patella baja over this time period. At nine months from the index TKA, ROM had stayed at 0–60°.

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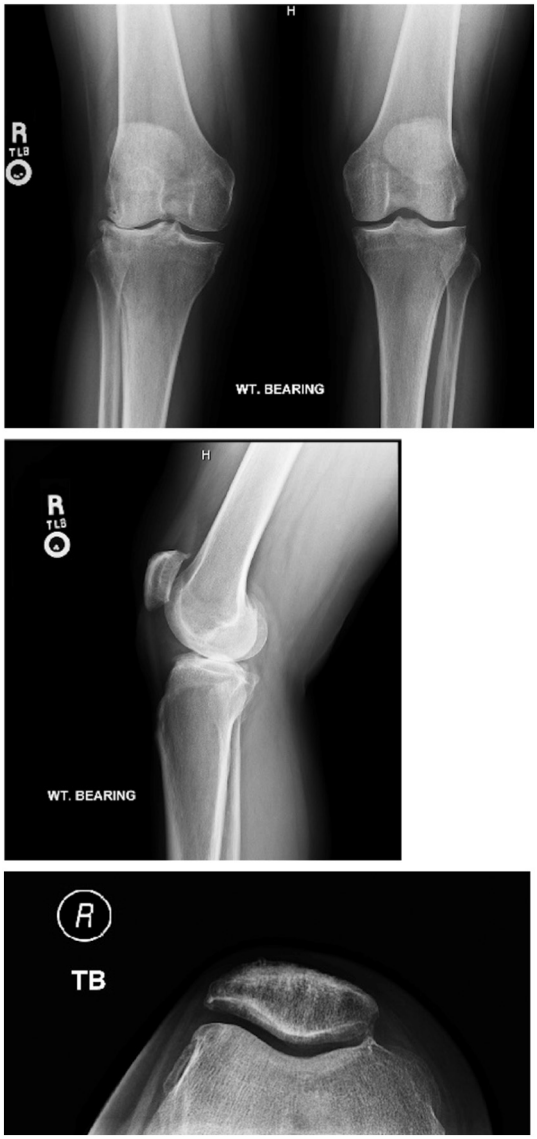

Figure 1. Initial preop films.

At one year from her index TKA, our patient underwent an extensor mechanism allograft reconstruction. An extensive soft tissue release was performed to regain ROM. The distal quadriceps tendon, patella, patellar tendon, and tibial tubercle were resected. The soft tissues appeared grossly scarred and fibrotic. The resected tissue was not sent to pathology.

We then placed a fresh-frozen extensor mechanism allograft. The patella was positioned to recreate normal patellar height. The tibial tubercle was fixed in place with three 4.5 mm stainless steel screws (Synthes, West Chester, PA.), and the quadriceps tendon was sutured using #5 Fiberwire (Arthrex, Naples Fl.), a non-absorbable polyethylene braided suture. The allograft patella had healthy appearing cartilage, and was not resurfaced because we felt an aneural graft could not be a pain generator. The allograft tibial tubercle was positioned in the place of the resected tibial tubercle. We chose not to alter the position of the tubercle, rather we relied on the length of the patellar tendon graft to restore the normal patellar height. She received one dose cefazolin prior to incision, and two doses postoperatively as per our standard institutional protocol.

The patient was allowed to immediately weightbear as tolerated in a hinged knee brace locked in extension for 6 weeks. After this time, bracing was discontinued, and unrestricted ROM and strengthening were begun.

Postoperative X-rays shown in Figure 6 demonstrate restoration of patellar height. At her office visits at three, six, nine, and 12 months X-rays continued to show normal patella relationships, and solid incorporation of the tibial tubercle graft. Pre-allograft ROM was 0–60°, post-allograft ROM is 0–100°, with mild difficulty going down stairs and occasional stiffness. She has significant pain relief compared with preop. Figure 7 is the X-rays from her 1-year follow-up visit, demonstrating maintained patellar height. Total change in ROM is a 40° improvement in flexion, with full extension to 0° maintained.

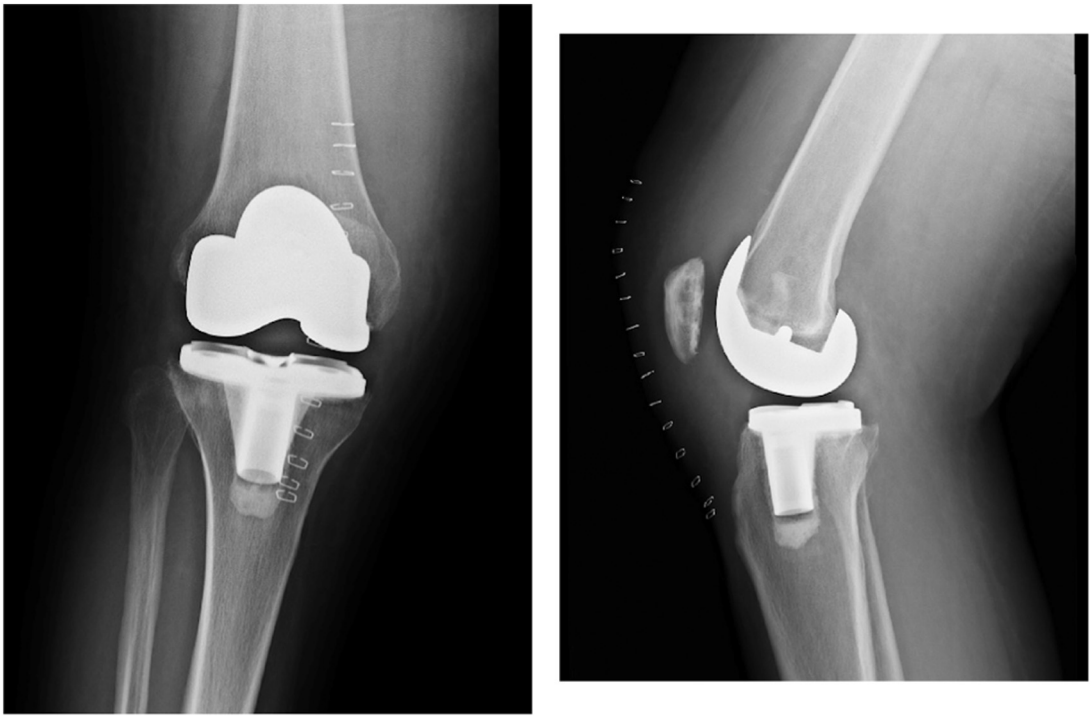

Figure 2. X-rays immediately after primary TKA.

2. Discussion

Patella baja and pseudo-baja are entities that can complicate TKA. When baja occurs after TKA it is usually iatrogenic. The cause is inappropriate elevation of the joint line by excessive distal femoral resection, and is described as pseudo-baja. The inappropriately elevated joint line is the issue, not a shortened patellar tendon. This leads to decreased ROM, pain, patellar impingement, decreased extensor lever arm and resulting decreased strength. While pseudo-baja is common following TKA for valgus OA, this was not the case in our patient.

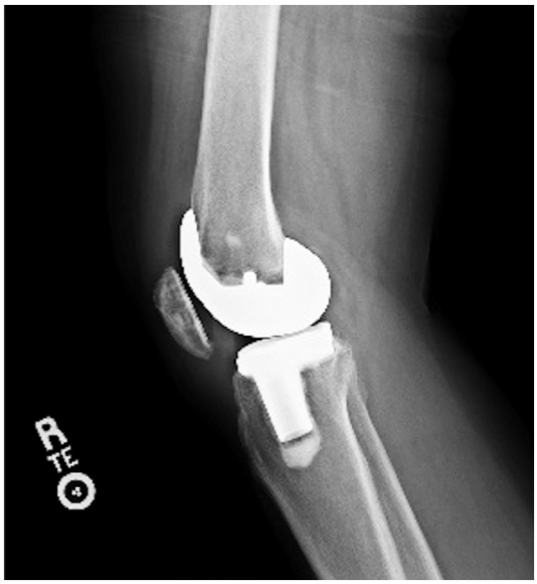

Figure 3. Three-month follow-up after index TKA.

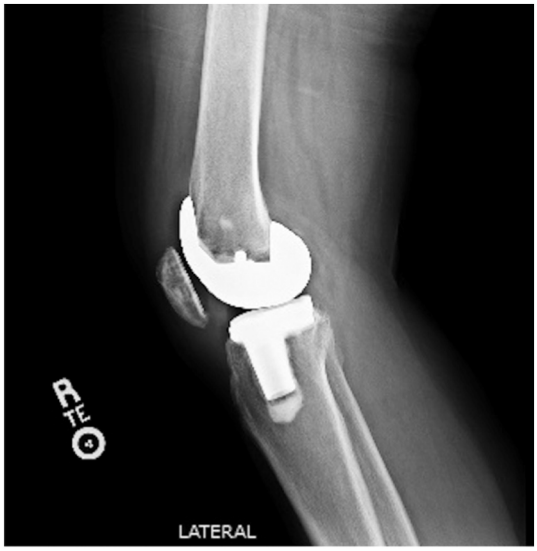

Figure 4. Six-month follow-up after index TKA.

Various methods of detecting patella baja can be used. The traditional methods of Insall-Salvati [1], Caton-Dechampes [2], and Blackburne-Peel [3] were all created to be used in a native knee. A newer modified method for assessing patellar height in TKA has been described by Classen, et al. [4]. Other investigators have discussed the radiographic findings of patella baja after TKA [5,6] in an effort to quantify and classify the problem.

Our patient did not have baja in the immediate postop period; it developed months after the index TKA. Her stiffness did not respond to treatment with MUA since it was likely mechanical in nature caused by baja, and not by simple soft tissue fibrosis.

Other possible treatments include patellar tendon lengthening, tibial tubercle osteotomy, and revision TKA with joint line alteration. We chose allograft reconstruction because we felt her tissues could scar and contract again after surgery, but using allograft tissue would be less likely in our opinion to contract since it does not have any live cells in it.

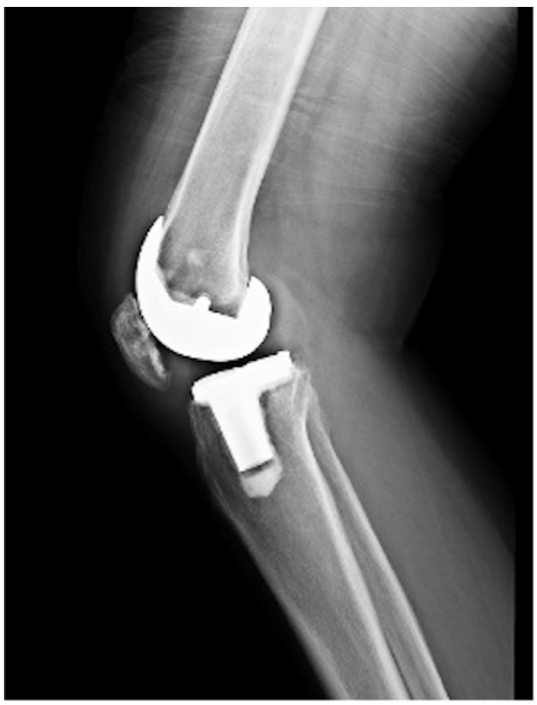

Figure 5. One-year follow-up after index TKA.

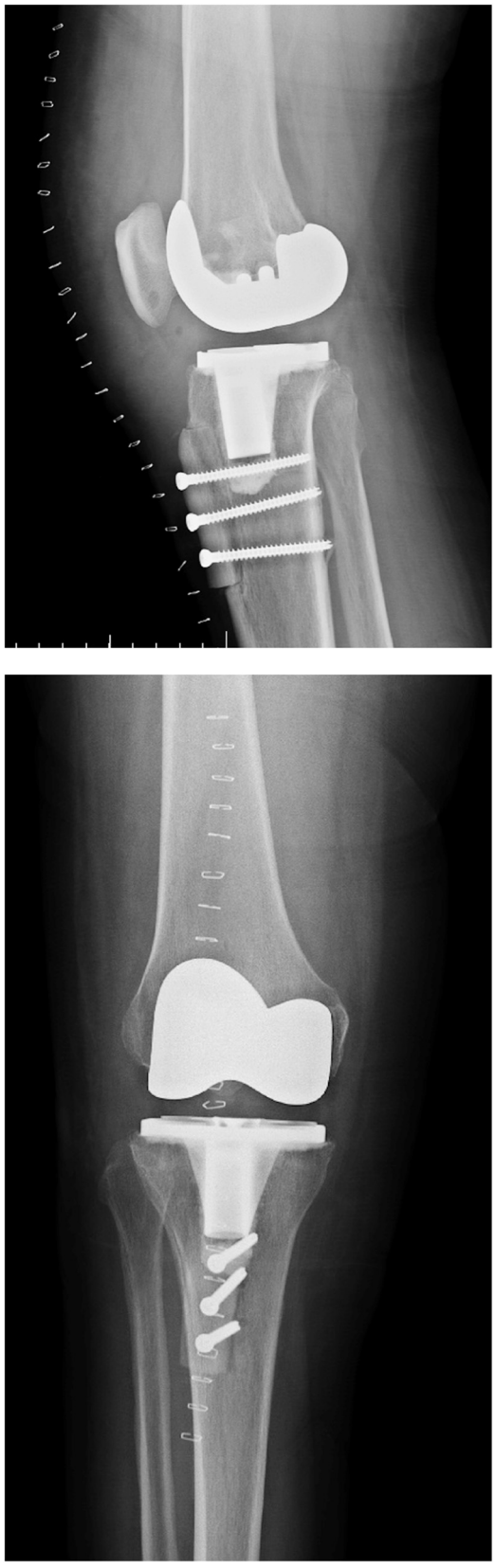

Figure 6. Immediately after extensor mechanism reconstruction.

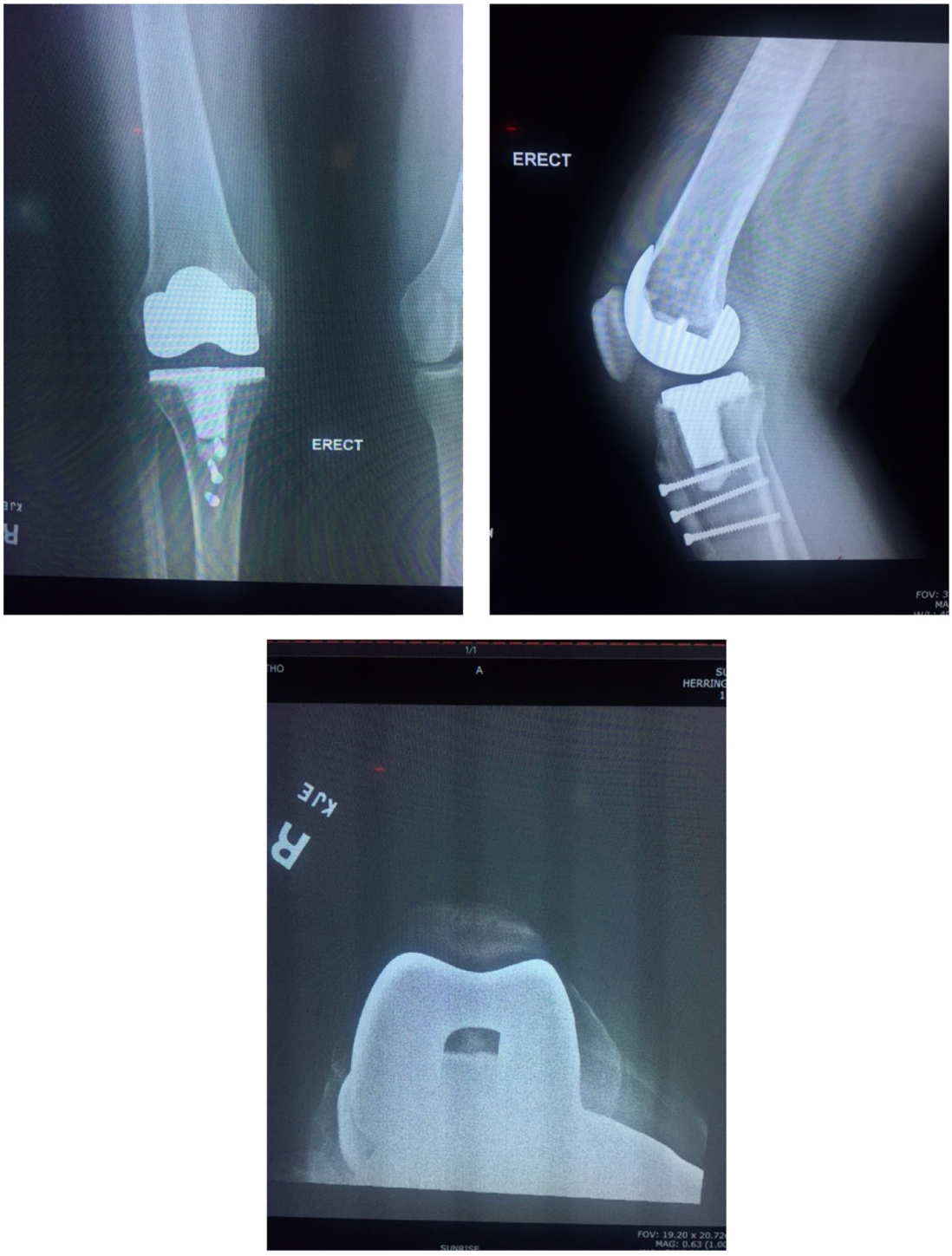

Figure 7. One year after extensor mechanism reconstruction.

Outcomes of extensor mechanism allograft reconstruction have traditionally been poor in the literature [7], and mesh reconstructions have similar outcomes [8]. This kind of reconstruction should be seen as a salvage option and should only be considered in selected cases. The most common indication for this procedure is extensor mechanism failure [9], and the quadriceps muscles tend to be weak in this scenario. We felt that our patient's good outcome was the result of her extensor mechanism being intact and strong prior to reconstruction.

Although rare, the complication of patella baja after TKA is a significant cause of patient dissatisfaction with TKA. Overall, our patient is happy with her result and this type of reconstruction offered her a way to overcome patella baja after TKA without doing major bone sacrificing revision surgery.

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