
Treatment of Failed Hauser Procedures Via Modified Maquet Osteotomy

Case Report

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ABSTRACT: *Four cases of failed Hauser procedures were treated with an osteotomy of the patellar tendon insertion and distal realignment. The patellar tendon insertion site was moved as a large bond block and positioned in neutral alignment as well as anterior to its previous position, effectively creating a "modified Maquet effect." Proximal realignment was performed in one patient. Intraoperative assessment of patellar tracking enabled accurate determination of optimal position. The clinical findings and the operative approach are described. All four patients experienced significant improvement from their preoperative status.*

INTRODUCTION

The Hauser procedure, described in 1938, involves repositioning of the tibial tubercle and patellar tendon insertion. Transplantation of the entire tibial tubercle to a

more medial and distal portion was advocated in order to address an abnormal Q-angle and patella alta.

The Hauser procedure previously enjoyed popularity for patellar malalignment for treatment of patellar instability.⁹ Others have reported a high rate of complications for the Hauser procedure, including medial patellar instability, advanced patellofemoral arthrosis, and patella baja.^{1,3,4,6,11}

This report describes four patients who had severe symptoms after a Hauser procedure and required reoperation. These patients had advanced patellofemoral arthrosis and one had additional arthrofibrosis.

CASE REPORTS

The four patients' pertinent histories and clinical examinations are described below. Clinical and radiologic follow-up were performed by an independent surgeon (M.P.N.) who did not participate in the patients' care.

Fulkerson's modification of the Lysholm scale was used to assess knee pain and function.⁵ This 100-point scale was modified to reflect patellar instability and pain due to patellofemoral pathology.

Case 1. A 49-year-old male underwent a Hauser procedure in 1960 for recurrent patellar subluxation and dislocation. He had no recurrent subluxation episodes but had noted progressive pain in his anteromedial knee with decreased range of motion. Physical examination revealed a -10° Q-angle at 90° knee flexion, a 5° flexion contracture, and marked crepitus in the patellofemoral

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joint. Radiographs showed degenerative changes in the patellofemoral joint and mild changes in the medial compartment. A bone scan showed uptake isolated to the patellofemoral compartment. Previous arthroscopy showed grade 4 Outerbridge changes on the medial patellar facet. The trochlea was normal except for grade 4 eburnation on the most medial aspect and grade 4 changes on the superior medial femoral condyle that corresponded to patellofemoral articulation.

Follow-up at 13 months after surgery found that the patient had ceased to have the catching sensation that had significantly bothered him. The Q-angle was $+5^\circ$. A flexion contracture of 4° persisted. Crepitus was unchanged. No instability was noted. Fulkerson's modified Lysholm score was fair preoperatively and good postoperatively.

Case 2. A 36-year-old female underwent a Hauser procedure for recurrent subluxation and dislocations of several years duration. She was casted for 6 weeks postoperatively. She was referred 4 months postoperatively with restricted range of motion (-20° to 50°) and knee pain. She had failed aggressive physical therapy and under anesthesia had a flexion contracture of 20° and a total range of motion of 30° . The Q-angle was -15° . Patellar mobility in the coronal plane was minimal.

The patient underwent arthroscopic intra-articular debridement and manipulation. During surgery, it became evident that an open procedure would be needed. After debridement of the suprapatellar pouch and intercondylar notch as well as the medial and lateral gutters, flexion of the knee was possible only to 60° . The extensor mechanism was clearly limiting flexion. The patellar tendon and tibial tubercle insertion was transferred proximally and to a neutral Q-angle position. Flexion was then possible to 110° . A single 1.5-AO cancellous screw was used to anchor the transferred bone.

Follow-up at 6 years after surgery revealed that the patient had 0° to 120° range of motion. She was able to climb and descend stairs without pain. The Q angle was $+10^\circ$. Crepitus was unchanged. Patellar mobility was two quadrants medially and one quadrant laterally. No instability was observed. Fulkerson's modified Lysholm score was very poor preoperatively and fair postoperatively. This patient has returned to work as a clerk.

Case 3. A 33-year-old male underwent a Hauser procedure in 1974 after recurrent episodes of patellar subluxation. Three years later, he underwent a patellar chondroplasty for worsened symptoms. A second patellar debridement was performed arthroscopically 6 years following the initial chondroplasty without relief. His pain became severe enough to limit activities of daily living. Physical examination revealed a Q-angle of -20° , severe patellofemoral crepitus, and a centered, relatively immobile patella. Range of motion was 0° to 130° . Radiographs showed a large medial patellar osteophyte and medial patellar facet subchondral sclerosis.

At surgery, the medial facet was found to be eburnated with wear of the distal medial trochlea and the proximal medial femoral condyle. A 2.5×5 cm osseous tongue was osteotomized, transferred, and secured with two 3.5-mm cortical screws to create a Maquet effect. Medial patellar osteophytes were debrided.

At $3\frac{1}{2}$ years follow-up, swelling and catching were minimal. The patient still had discomfort but was able to comfortably perform activities of daily living. The Q-angle was 0° . Motion was normal. Crepitus was moderate. Patellar mobility was one quadrant medially and two quadrants laterally. The Fulkerson's modified Lysholm score was very poor preoperatively and fair postoperatively.

Case 4. A 41-year-old female with generalized ligamentous laxity underwent a Hauser procedure in 1972 for recurrent patellar instability. At the time of referral, she had longstanding, increasing pain and was experiencing recurrent episodes of lateral subluxation. Physical examination revealed that the lateral edge of the patella was easily evertable to 45° . The Q-angle was -5° . Patellar mobility was two quadrants medially and three quadrants laterally. Radiographs showed a loose body in the intercondylar notch and patellar subchondral sclerosis. The tibial tubercle has been transferred distally and medially. There was no patella baja. Findings at arthroscopy were Outerbridge grade 3 and early grade 4 changes in the lateral as well as medial facet. A medial femoral condylar and trochlear osteophyte was noted. The trochlea itself was hypoplastic with shallow groove.

After loose body removal, a block osteotomy (2×4 cm) of the patellar tendon insertion was performed and transferred to the anterior crest of the tibia. Elevation of the patellar tendon was estimated at 10 mm. Three cancellous screws were used to secure the block. A proximal realignment was performed via a lateral release and vastus medialis obliquus advancement.

At 3 years postsurgery, recurrent swelling and catching as well as instability symptoms were absent. She had occasional pain with activities of daily living. Moderate crepitus was present, and she had symmetrical range of motion, with 5° of hyperextension. Patellar mobility was one quadrant medially and three quadrants laterally. Fulkerson's modified Lysholm score was fair preoperatively and good postoperatively.

SURGICAL TECHNIQUE

The goal of surgical treatment in these patients was to correct the abnormal patellar tracking and decrease patellofemoral forces. In case 2, intra-articular adhesions also were released to increase range of motion. Assessment of patellofemoral tracking was done prior to anchoring the patellar tendon bone block into place.

Under either epidural or general anesthesia and tourniquet, a midline incision was made if possible. If previous

