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Short- and Medium-Term Outcome of Polyurethane Artificial Menisci

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Summary:
Short-term clinical evaluation of the anchored degradable polyurethane meniscal replacement after meniscectomy showed an initial improvement of pain and knee function. However, the number of short-term failures was high and associated with significant morbidity.

Abstract:
INTRODUCTION
Meniscal tears are very common and treated surgically by suturing or by partial or total meniscectomy. After meniscectomy, the tibiofemoral contact area is decreased which leads to higher contact stresses associated with clinical symptoms and a faster progression of tibiofemoral osteoarthritis. Besides meniscus allograft transplantation, artificial implants have been developed to replace the menisci after meniscectomy. We investigated the short- and medium-term clinical results and survivorship of anchored polyurethane degradable meniscal implants implanted between 2008 and 2013 as a treatment for post-meniscectomy pain in young to middle-aged patients.

MATERIALS AND METHODS
50 polyurethane menisci were implanted in 50 patients (27 men, 23 women) with a mean age of 30.5 years (12 to 50) as a lateral meniscus replacement in 20 cases and a medial meniscus replacement in 30.

RESULTS AND DISCUSSION
Eleven polyurethane artificial menisci (22%) had been removed at a mean of 21 months postop (11 to 39) for persisting pain and implant tear and/or extrusion of the implant on MRI. Two were immediately converted to a Total Knee Arthroplasty (TKA), 5 replaced by a meniscal allograft and 4 were removed without replacement. Three patients were lost to follow-up. The cumulative survivorship was 69% at 4.2 years. In five patients additional surgery was required including 1 osteotomy, 2 arthroscopic microfractures and 2 ACL reconstructions. Twenty-four patients with the polyurethane meniscus still in situ had a significant improvement of all clinical scores compared to preoperative scores ($p<0.05$) and were satisfied with the result. Follow-up MRI in 37 patients showed partial or total resorption of the degradable meniscus in 4 cases, a tear in 2, shredding of the implant in 6, and bone edema in 4. Mean implant extrusion was 3mm (0-8.7mm).

CONCLUSIONS
Short-term clinical evaluation of the anchored degradable polyurethane meniscal replacement after meniscectomy showed an initial improvement of pain and knee function. However, the number of short-term failures was high and associated with significant morbidity. In conclusion, currently available artificial meniscal transplants have a too high short-term failure rate to be advocated for widespread clinical use.