



## Osteochondral allograft implants work

**Best results were seen with grafts less than 28 days old for large lesions and other knee graft defects.**

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Fresh osteochondral allograft implantation is effective as a treatment for large lesions and other knee joint defects, according to a Chicago orthopedic surgeon.

Brian J. Cole, MD, MBA, an associate professor in the departments of orthopedics and anatomy and cell biology at Rush University Medical Center and director of the university's Cartilage Restoration Center, said osteochondral allograft implantation (OCA) can yield positive clinical outcomes and high satisfaction rates.

Cole, who frequently uses fresh OCA transplantation, meniscal allograft transplantation and cartilage cell transplantation in his knee and shoulder procedures, spoke about the potential benefits of OCA at the 6th Symposium of the International Cartilage Repair Society.

In fresh OCA transplantation, grafts are normally harvested within 24 hours after the donor's death and transplanted in less than seven days. In "prolonged fresh" transplantation, grafts are inserted up to 28 days after harvest, he said.

"Historically, fresh osteochondral allograft transplantation has the longest and most successful follow-up in the literature," Cole said, noting that some 15-year follow-ups produced 80% to 95% success rates.

Data on prolonged fresh OCA transplantation are limited; however, results show that grafts implanted less than 28 days after harvest typically give the best results, he added.

Cole and fellow researchers studied 25 patients (18 men, seven women). An average 25 months elapsed between symptom onset and OCA transplantation. The mean age at follow-up was 35 years, and the mean follow-up was 35 months. The group included two osteonecrosis patients; 24 patients had previous surgery. The time between donor death and graft implantation averaged 19.3 days.



A fresh osteochondral allograft is ready for implantation. Results are best when grafts are transplanted within 28 days after harvest, investigators reported.



Pictured above is an osteochondral defect that is a prime candidate for fresh osteochondral allograft implantation, which has shown 80% to 95% success rates.



A newly transplanted fresh osteochondral allograft. Fresh transplantations have yielded strong results, low complication rates and high patient satisfaction.

Courtesy of Brian J. Cole

Cole selected patients with lesions that averaged 4 cm in diameter and relatively deep, those with osteochondral defects, those with localized avascular necrosis without ongoing steroid insult, and those with defects occurring following trauma. Patients were generally considered at a moderate-to-high demand level, he said. Cole used plain radiographs corrected for magnification to size the hemicondyles obtained from the tissue bank.

During defect and graft preparation, he used cold irrigation to minimize thermal necrosis, and a recipient socket for the allograft was created no more than 8 mm in total depth.

Generally, OCA plugs were implanted without supplemental fixation.

Cole separated primary and secondary lesions, with primary lesions averaging 5.24 cm and secondary lesions averaging 3.21 cm. Nineteen patients received one plug and six received two plugs. The average graft age at implantation was 24 days, Cole said.

Postoperatively, patients' rehabilitation involved continuous active motion. Athletes were restricted from high impact activities for at least 12 months because of prolonged graft incorporation, Cole said.

Eighty-eight percent of grafts were incorporated at follow-up. Complications comprised one fragmentation that was revised and there was one infection treated by graft removal.

### **Function, satisfaction**

Patients showed strong improvement on clinical and radiographic tests and patient surveys, such as International Knee Documentation Committee (IKDC), Lysholm, Knee Injury and Osteoarthritis Outcome Score (KOOS) daily activity scale and KOOS sport scale.

Also, patient satisfaction, when comparing the operative and nonoperative leg, averaged 79% and general satisfaction averaged 84%, Cole noted. However, patients did not score as well when grafts were more than 28 days old, Cole said.

"One of the variables we were interested in was the graft age at the time of implantation. We [suggested] ... that those grafts that are greater than 28 days old had a higher KOOS pain score, symptom score and activities of daily living score, and those differences were statistically significant compared to grafts implanted before 28 days," Cole said.

Various preservation processes influence grafts' viability, he said. Still, he advised surgeons to approach prolonged fresh OCA transplantation with caution.

"We think we need to look a little more carefully at this [recommended] graft age of more than 28 days," Cole said. "Otherwise, our results at least appear to be comparable to [those in] the literature of fresh osteochondral allograft transplantation when these grafts were typically implanted prior to seven days and before some of these logistic issues came into place."

#### **For more information:**

- Cole BJ, Sobhy MH, Kang, RW, et al. Prospective evaluation of fresh osteochondral allograft transplantation of the femoral condyle: minimum 2-year follow-up. Presented at the 6th Symposium of the International Cartilage Repair Society. Jan. 8-11, 2006. San Diego.

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