Wear Performance Improved With Highly Cross-Linked Polyethylene Acetabular Liners

Written by Emma Hitt Nichols, PhD

Acetabular liners made with highly cross-linked polyethylene (XLPE) have greater wear performance and do not cause osteolysis compared with conventional polyethylene (CPE) liners in patients that have undergone total hip arthroplasty (THA). Koji Tsuji, MD, University of Florida, Gainesville, Florida, USA, presented data from a study that evaluated the long-term performance of XLPE acetabular liners in THA.

Osteolysis caused by polyethylene debris is a major complication that can occur following THA. *In vitro* studies of XLPE acetabular liners demonstrated low wear rates. In addition, short-term clinical studies have demonstrated that acetabular liners made of XLPE had better wear performance than CPE liners. The purpose of this study was to determine the long-term wear performance of XLPE versus CPE in patients that had undergone primary THA.

Patients undergoing THA were enrolled between 2003 and 2005. The surgery was performed by a single surgeon using the anterolateral approach and the same liner design was randomly assigned at surgery. The prosthesis used was a cementless cup with a 26-mm cobalt-chromium (CoCr) head. Wear performance was determined by radiography using the Roman assessment method. Assessment included femoral head penetration and supine AP X-p at 3, 6, 9, 12, 18, 24, 36, 48, and 60 months post surgery and at the final follow-up. Femoral head penetration was assessed by measuring the distance between the center of the acetabular head and the center of the acetabular cup as visualized by radiograph.

In the study, 188 hips were replaced with a mean follow-up of 81 to 82 months. The mean patient age was 57 and 61 years in the XLPE and CPE arms, respectively. The mean body weight was 54 kg and the mean body mass index was ~23 kg/m^2.

XLPE liners demonstrated a better wear performance than the CPE liners. The mean femoral head penetration was greater in the patients who had received the CPE liner compared with those who received the XLPE liner at final follow-up ($p<0.05$). The total femoral head penetration rate was 0.041 and 0.003 for the CPE and XLPE arms, respectively, resulting in a 92% decrease in the mean penetration rate. There were no reports of osteolysis in the XLPE arm compared with 7.9% of patients experiencing osteolysis in the CPE arm at final follow-up ($p=0.005$). Osteolysis was observed at ~6 years post surgery at Gruen Zone 1.

Dr. Tsuji indicated that the 92% decrease in the femoral penetration rate observed with XLPE liners is consistent with previous studies that had shown 30% to 90% reductions. Wear rates were not associated with patient demographics. Dr. Tsuji stated that, in his opinion, the data from this study suggest that XLPE liners improve wear performance with less incidence of osteolysis compared with CPE liners in patients that have undergone THA.

Low-Dose Dexamethasone Before TKA Reduces Postoperative Nausea, Vomiting, and Pain

Written by Nicola Parry

Study data was presented by In Jun Koh, MD, Uijeongbu St. Mary's Hospital, Seoul, Republic of Korea, demonstrating that patients who receive preemptive low-dose dexamethasone prior to total knee arthroplasty (TKA) have a reduced incidence of postoperative pain, nausea, and vomiting [Koh IJ et al. *Clin Orthop Relat Res* 2013].

Although TKA is one of the most effective treatments for advanced knee arthritis, many patients suffer significant pain due to the procedure, as well as postoperative nausea and vomiting (PONV) associated with anesthesia and analgesia. Yet despite the potential clinical benefits of using low-dose dexamethasone to manage these symptoms, there remains little data on its use in this setting. This study therefore set out to compare the preemptive addition of low-dose dexamethasone with a multimodal protocol including the antiemetic ramosetron (Dexa-Ra), with ramosetron alone (Ra). It aimed to determine whether preemptive Dexa-Ra would lead to improved reduction in PONV and additional analgesic effect, and whether dexamethasone increased the risk for wound complications in these patients.

Patients undergoing TKA (n=269) were randomized to Dexa-Ra (dexamethasone 10 mg 1 hour before surgery, and ramosetron immediately post operatively; n=135), or Ra alone (n=134), and were evaluated 0 to 6, 6 to 24, 24 to 48, and 48 to 72 hours after surgery. Symptoms were scored using a 0 to 10 visual analog scale (VAS). At a minimum of 1 year post TKA, patients were also assessed for wound complications and periprosthetic joint infections.

Incidence of PONV was the primary outcome. Secondary outcomes were complete response, pain level, severity of nausea, and incidence of wound complications in addition to use of rescue antiemetics and opioid consumption.

During the 72-hour evaluation period, Dexa-Ra administration was associated with a reduced incidence of postoperative nausea (24% vs 40%; p=0.004), vomiting (7% vs 21%; p=0.001), and use of rescue antiemetics (17% vs 35%; p=0.001), as well as an increased complete response