Update on Hard-on-hard Bearings in Hip Arthroplasty

Editorial Comment

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Presently, THA can reliably reduce pain and improve function in the greater majority of patients at followup times of 10 to 20 years. The procedure was initially used for lower-demand, older patients with the goal of reducing pain and increasing the ability to perform activities of daily living. However, patients are living longer and desiring to maintain higher activity levels well into their senior years. In addition, because of the potential increased durability, THA has been increasingly used in young patients, a population that often places higher stress on the prostheses and has a higher life expectancy than the previously treated geriatric population.

Historically, the dominant interface used in THA was a metal femoral head component articulating with an acetabular component made of high-molecular-weight polyethylene. However, higher activity levels were associated with increased polyethylene wear rates, debris, and implant failure due to aseptic loosening [1–3]. This led to efforts made to develop bearings that might decrease wear rates. This encompassed two pathways: (1) modification of traditional metal-on-polyethylene bearings and (2) renewed interest in alternate hard-on-hard interfaces. These hard-on-hard bearings using metal and ceramic materials promised increased implant longevity and reduced wear secondary to enhanced manufacturing techniques and improved tribology. In addition, the metal implants could be developed

Michael A. Mont, MD, is shown.

with larger head sizes, which had the potential advantage of decreasing dislocation rates over more traditional smaller-diameter heads previously used with metal-on-polyethylene bearings. This symposium will focus on whether these newer generations of hard-on-hard interfaces meet those promises. Many of the selected papers from this issue derived from the Third Annual Hip Joint Course entitled “Joint Preservation and Resurfacing Arthroplasty” held at the Marriott Waterfront Hotel in Baltimore, MD, on September 4 to 5, 2009. The meeting was attended by more than 300 surgeons, allied health professionals, and representatives of more than 15 major US prosthetic companies. The articles primarily focus on metal-on-metal and ceramic-on-ceramic interfaces in various devices, with topics ranging from basic science and clinical results to

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analyses of adverse events, to address many of the recent concerns that have surfaced in the research, clinical, and public arena. We believe this compilation summarizes many of the current principles and the latest technology concerning these interfaces and will act as a stimulus for further study.

I would like to express my deep gratitude for help with not only our Hip Course but also the planning and editing of manuscripts in this symposium to Drs. Thomas Schmalzried, Thorsten Seyler, Michael Zywiell, and Aaron Johnson.

References

1. Iannotti JP, Balderston RA, Booth RE, Rothman RH, Cohn JC, Pickens G. Aseptic loosening after total hip arthroplasty: incidence, clinical significance, and etiology. *J Arthroplasty*. 1986;1: 99–107.
2. Revell PA, Weightman B, Freeman MA, Roberts BV. The production and biology of polyethylene wear debris. *Arch Orthop Trauma Surg*. 1978;91:167–181.
3. Schmalzried TP, Jasty M, Harris WH. Periprosthetic bone loss in total hip arthroplasty: polyethylene wear debris and the concept of the effective joint space. *J Bone Joint Surg Am*. 1992;74:849–863.