Excellent midterm survival and outcome of the fully hydroxyapatite-coated Polarstem™

First results of a prospective multicenter study

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Background
The design of Polarstem is based upon a Corail-type tapered straight stem, an implant with an excellent survival rate. An unpublished data extract from UK National Joint Registry in 2016 shows a revision rate of 0.8% after 5 years which is below the overall rate for registered cementless hip stems. Up to now there have been no prospective studies published concerning efficacy and patient self-assessment in those treated with the cementless Polarstem.

Objectives
The objective of this study was to prospectively evaluate the functional, radiographic, and survival outcomes of the cementless Polarstem at midterm follow-up.

Study design & Methods
This prospective observational study conducted at three independent orthopaedic hospitals (Kantonsspital Aarau Switzerland, University Hospital Marburg Germany, St. Elisabeth-Hospital Bochum Germany) in two European countries was designed to collect data in patients undergoing cementless primary total hip arthroplasty (THA) for various reasons. The study was performed according to ISO 14155 guidelines and in accordance with the Declaration of Helsinki. All patients signed the Informed Consent prior to surgery and the approval of the local Ethics Committee was obtained for all sites. A total of 225 THAs (75 at each site) were included. The predominant diagnosis was primary osteoarthritis. A conventional translateral approach was applied in 177 hips (79%), an anterolateral approach in 5 (2%), and an anterior approach in 43 (19%). Anteroposterior and lateral X-rays were obtained at each follow-up interval (3 months, 1 year, 3 years, 5 years). The modified Harris Hip Score (mHHS) and Western Ontario and McMaster Universities Index (WOMAC) were also collected.

Results
Patients experienced statistically significant improvements from baseline in mean mHHS (48.5 to 88.0, p<0.01) and WOMAC scores (58.6 to 9.3, p<0.01) at all intervals and each subscore through 5 years. The stem survivorship was 99.6% (95%CI, 96.9-99.9) at 5 years with stem revision due to any reason. Within the first 3 months one patient had a stem revision due to septic complication and therefore was not available for further follow-up. Three cup revisions in two subjects were performed, both subjects continued in the study as the stem was not revised. No cases of mechanical failure of the stem or signs of radiographic loosening were observed.

Conclusions
In our study the Polarstem revision rate for any reason was 0.4% after 5 years follow-up. This survivorship is well in line with current requirements. Our clinical results based on modified Harris Hip Score and WOMAC represent a good to very good outcome and are the first published concerning the Polarstem based on a prospective multicenter study. Therefore safety and efficacy of the cementless Polarstem can be confirmed.