INTRODUCTION
Resurfacing hip arthroplasty is becoming a popular alternative to total hip arthroplasty, since the introduction of the Birmingham Hip Replacement in the early 1990’s. Many new resurfacing devices have been introduced since then, but none of them have an adequate long-term follow-up. Importantly, small design modifications to a prosthesis can significantly affect the survivorship.

Roentgen Stereophotogrammetric Analysis (RSA) has been shown to predict long-term outcome by measuring the migration of a prosthesis within the first two years of implantation. The aim of this study was to determine the migration of the Conserve Plus femoral component, using RSA.

METHODS
Twenty-two patients (11 males and 11 females) with early degenerative osteoarthritis of the hip were recruited for the study. Two patients had to be excluded from the study because the tantalum RSA beads placed in the bone had moved. The average age of the patients was 55 years (SD: 6.5 years). Our RSA system can measure three-dimensional (3D) movements of a marker with an accuracy of 0.1 mm and the limit for marker migration was 0.01 mm.

RSA radiographs were taken, with patients standing weight-bearing, post-operatively and subsequently at 6, 12 and 24 months. The overall 3D migration of the implant head and tip was calculated for each patient. This migration was calculated in the global Cartesian coordinate system of the calibration frame, and was also transformed into the anatomical coordinate system (antero-posterior, medio-lateral & supero-distal). A one-sample t-test was used to detect significant deviations of the mean movement from the zero. Statistical significance was taken at the 5% level (p < 0.05). The clinical outcome of each patient was assessed using the Oxford Hip Score (OHS).

RESULTS
The overall 3D migration at 24 months was 0.20 mm for the head and 0.21 mm for the tip; migration in three anatomic directions (antero-posterior, medio-lateral & supero-distal) for the head was 0.20 mm (SD: 0.54) anterior, 0.01 mm (SD: 0.49) lateral and 0.004 mm (SD: 0.67) distal and for the tip was 0.05 mm (SD: 0.43) anterior, 0.20 mm (SD: 0.97) lateral and 0.01 mm (SD: 0.30) distal (Table 1, Figures 1 and 2). All migrations were not significant at any of the time points, 6, 12 and 24 months. The mean OHS at 2 years was 14 (SD: 3.8).

One outlier was present in the data set with an unusually high migration. This patient had a 4.2 mm lateral migration of the tip and 2.1 mm distal migration of the head at two years. The patient was asymptomatic at two years with an OHS of 12; the patient then started to develop pain over a period of 8 months and the OHS deteriorated to 22. X-rays performed at 3 years showed a radiolucency of 2 mm on either side of the stem of the femoral component.

DISCUSSION:
The preliminary results of this RSA study are encouraging and suggest that the Conserve Plus implant exhibits little migration in almost all patients. This signifies that, in general, the device is stable during the first two years after implantation and that it should remain stable in the long-term. Of concern, however, is that one patient has unusually high migration and has developed a radiolucency around the tip of the femoral component and a painful hip. This single case is loose.