



Learning curve may be longer than thought for placing hip resurfacing components

It took surgeons 55 to 60 cases to get femoral components within $\pm 5^\circ$ of planned placement.

By Susan M. Rapp

ORTHOPEDICS TODAY 2007; 27:12

May 2007



British and Australian researchers collaborating on a prospective study identified a longer-than-expected learning curve to accurately perform hip resurfacing arthroplasties.

Hip surgeons taking part in the study, all of whom had performed more than 1,000 hip surgeries, found they had to complete three-times more resurfacing surgeries than they expected in order to place the femoral hip resurfacing components within $\pm 5^\circ$ of the desired neck/head angle, said Diane L. Back, FRCS.

The surgeons had initially estimated their learning curve at 10 to 20 cases, Back told *Orthopedics Today*.

"The results actually showed that it took 55 to 60 cases for most of our surgeons to get the femoral component where they actually planned it," she said.

Expect inaccuracies

These results only pertain to hip resurfacing, Back noted. Similar studies have not been conducted into the learning curve for other types of hip arthroplasty, so she hesitated to say whether the resurfacing technique's learning curve was longer.

Back and colleagues studied resurfacing arthroplasty because few independent studies had been performed on the technique's learning curve and she was curious how long it took surgeons skilled in basic tissue handling and hip surgery principles to master it.

Based on the results, she told others to expect their margin of error implanting the femoral resurfacing components to be high for the first few years, no matter how skilled they were.

Four surgeons participated

Back and colleagues prospectively analyzed the first 100 hip resurfacing procedures of four consultant orthopedic surgeons, three from Australia and one from the United Kingdom.

They performed all procedures with the recently reintroduced Birmingham Hip Resurfacing System [Smith & Nephew]. The FDA approved the implant for sale in the United States last year.

All surgeons used standard instrumentation and a posterior approach. Investigators focused on femoral component position, but also analyzed notching and other complications.

To determine how accurately they placed the femoral components, surgeons first marked the ideal implantation site on preoperative radiographs. Investigators then calculated the corresponding neck/head angle.

Radiographic angles

On postop radiographs investigators determined the neck/head angle of the implanted femoral component.

They compared the two angles, allowing a $\pm 5^\circ$ difference, and saw extreme variations between planned and achieved implant position. They noted the positioning gradually improved as surgeons did more cases.

"They [were] starting to narrow in their variation, but there was still great variation in what they planned and what they actually achieved," Back said, during the American Academy of Orthopaedic Surgeons (AAOS) 74th Annual Meeting, where she presented the initial findings.

The surgeons tended to be more accurate in extreme cases of anatomic variation. "But, on the more common angles, they were not actually getting what they wanted," Back said.

For example, in one surgeon's series, implants were positioned between $+20^\circ$ and -20° of their intended location. Longer curve than expected

The longer-than-expected learning curve has huge implications for surgeons' success with this type of hip replacement, Back told *Orthopedics Today*.

"Hip resurfacing is good. I think that is well proven. You have to choose your right cases, but it does take you longer than you expect to learn. I think medico-legally it does have some implications."

For example, surgeons just learning the procedure should tell patients they are at the beginning of their learning curve and have not done many of the procedures, she said.

In the United States where orthopedists begin practicing after completing fewer hip replacements than surgeons in the United Kingdom or Australia, "It actually means their learning curve may take them 10 years to get out of," Back said.

Back said she wonders how, with the worldwide trend toward reduced orthopedic training hours, many new surgeons would be able to accrue enough cases to become proficient with the technique.

She ended her presentation saying it was difficult to extrapolate these findings into clinically relevant information since there were still not enough long-term data about survivorship of resurfaced hips based on component placement.

"Have we got any data past 5 years that says varus is worse than valgus? No. Does varus fail earlier? Not necessarily," she noted.

When the paper was discussed, Back explained she also analyzed other factors important to resurfacing outcomes, such as complications, operative time, cyst preparation and acetabular component alignment, and plan to present those in the future.

For more information:

- Diane L. Back, FRCS, Ed Orth, Guy's and St. Thomas Hospital National Health Service, Lambeth Palace Road, London, United Kingdom SE17EH; +44-20-7188-4435; diane.back@gstt.nhs.uk. She indicated she has no financial disclosures related to this article.
- Back DL, Smith JD, Dalziel RE, et al. Establishing a learning curve for hip resurfacing. #130. Presented at the American Academy of Orthopaedic Surgeons 74th Annual Meeting. Feb. 14-18, 2007. San Diego.