Is there a difference in outcomes between collared and non-collared uncemented femoral stems in primary total hip arthroplasty?

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Response/Recommendation: The use of both collared and non-collared uncemented femoral stems results in an excellent clinical outcome in patients undergoing total hip arthroplasty. However, the rate of periprosthetic fractures is lower for the collared stems despite similar survivorship

Level of evidence: Strong

Rationale:

The literature is rich with numerous studies, including many high-volume national registry and some systematic review studies, comparing collared versus non-collared uncemented femoral stems in patients undergoing total hip arthroplasty (THA). This systematic review was conducted to extract data related to these two different designs of femoral stem.

The studies collected data on important variables such as subsidence, periprosthetic fractures, overall complications and need for revision surgery. In addition, patient reported outcomes (using WOMAC, Harris hip score, UCLA), radiographic outcome, and survivorship were evaluated. The influence of surgical approach, age, and other variables were also assessed [1, 10].

In general, all studies reviewed demonstrated an excellent survivorship for both stem types with similar radiographic and functional outcomes [1,2]. However, there was a significant difference between the two stems with regards to the rate of periprosthetic fracture, subsidence, and rotational instability, with data favoring collared uncemented femoral stems [3 -9]. On the other hand, subsidence may not be clinically relevant as the revision rate is similar [1] and some articles may have bias on a particular stem type.

Among many recent studies, seven reported on the patients from national registries that included the American, Australian, German, Norwegian, and UK joint registry. The studies were conducted over the last 5 years and included a large number of patients that ranged from 59,518 to 337,647 undergoing THA. The main outcome of these studies was periprosthetic fractures incidence and collared stems [3-9]. The most common femoral stem evaluated was Corail.

There were 4 systematic reviews with slightly different analysis and conclusions. Two systematic reviews demonstrated decreased complication rates with long stems as well as collared ones [2, 11]. Three reviews showed no difference in revision rates [1-2, 11]. One review found lower revision rates with collared stems [10]. The finding of higher revision rates in one review could be due to use of smaller stems [8]. One systematic review included only randomized controlled studies and found differences in subsidence rates but no superiority of collared stem [2] and otherwise similar clinical outcomes [1-2, 10-11].

An explanation was offered regarding the differences in the rate of subsidence and periprosthetic fracture seen between the two stems. The collar, resting on the calcar, is believed to provide a protective effect against subsidence and subsequent fracture [10]. The rotational stability of collared stems is also thought to be higher. However, there are some unresolved issues. There is a theoretical issue with the use of collared stem. The collar, particularly when prominent, is thought to be responsible for iliopsoas tendon irritation and subsequent groin pain. Another issue with the use of collared stem relates to the need to seat the stem on the calcar that in itself can result in intraoperative periprosthetic fractures. The rate of intraoperative fractures was not reported in any of the studies that we reviewed.

In conclusion, it appears that the use of collared stem (at least the one common stem that was evaluated) results in a reduction in the rate of periprosthetic fracture. Thus, surgeons starting to familiarize themselves with the use of a femoral stem at the start of their carrier may want to consider these findings that may influence their choice of a femoral stem.

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