

Bad Results for a Total Hip Arthroplasty – Bad Implant or Bad Surgeon?

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Introduction

Hip replacement surgery is considered the operation of the 20th century, and the vast majority of patients who have undergone it achieve excellent clinical results. However, in around 5% of cases, the clinical results are disappointing or poor, necessitating a hip prosthesis revision.

These unsatisfactory results can be attributed to one of two main reasons: either the design of the prosthesis is poor (in terms of its biomechanical concept, materials, tribology, etc.), or the orthopaedic surgeon lacks the dexterity required to place the prosthesis under the best possible conditions.

Although national registries make it possible to identify problematic prostheses on a national scale, they do not provide information on the results obtained by individual surgeons. Even though an increasing number of registries are publishing hospital or clinic results in the form of funnel plots, it is not possible to draw conclusions about a particular surgeon based on these results.

Methods

A secondary analysis of a recent publication based on data from the Australian registry¹ was performed using published cumulative revision curves from the Australian Orthopaedic Association National Joint Replacement Registry (1999–2022), encompassing 302,066 THAs performed by 476 surgeons. The original study categorized both implants and surgeons' dexterity into three performance tiers (good, average, poor) based on revision rates.

We digitized the published cumulative revision curves and calculated the linear slope between 2 and 16 years post-operatively to derive an Annual Revision Rate Increase (ARRI) for each implant-surgeon combination. The 2-year starting point was chosen to exclude early technical failures; the 16-year endpoint represents the limit of reliable data. This approach reframes the original surgeon-centric analysis into an implant-centric perspective.

Results

The weighted average ARRI across all implant-surgeon combinations was 0.360%, meaning the average revision rate for total hip arthroplasties increases by around 1% every three years in Australia. Naturally, extreme ARRI values occur with extreme combinations. For example, the combination of 'good implant – good surgical dexterity' has an ARRI of 0.159%, whereas the combination of 'poor implant – poor surgical dexterity' has an ARRI of 0.834%.

The following two sets are particularly interesting to compare: 'good implant – poor surgical dexterity' and 'poor implant – good surgical dexterity'. The ARRI values are as follows: 'good implant – poor surgical dexterity / ARRI: 0.346%' and 'poor implant – good surgical dexterity / ARRI: 0.272%'. These results demonstrate that surgical dexterity is a key factor in influencing the revision rate for total hip replacements. A surgeon with good dexterity who uses a poor-quality implant will perform fewer revisions (-27%) than a surgeon with poor dexterity who uses a high-quality implant.

This conclusion is supported by the findings of this article, which state that "The main difference between surgeons with a low revision rate and surgeons with a high revision rate is that those with a high revision rate have more revisions because of potentially preventable and technical causes of revision apart from prosthesis choice."

Limitations

This secondary analysis has inherent limitations: curve digitization introduces measurement error, linear approximation of non-linear survival curves is a simplification, and statistical comparison of ARRI values could not be performed due to unavailable raw data.

Conclusions

This analysis strongly suggests that surgical dexterity is an essential factor in ensuring the success of hip replacements. National registries should consider identifying surgeons with poor surgical dexterity and assist them to improve their surgical skills.

References

- (1) W. Hoskins et al. / Clin Orthop Relat Res. 2025;483:237-250.