Resurfacing as an Alternative to Total Hip Arthroplasty: Knowledge Synthesis of the Causes and Rates of Early Failure

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Introduction

Hip resurfacing is an increasingly popular surgical alternative to total hip arthroplasty (THA) for young and active patients. The safety of metal-on-metal (MOM) resurfacing is the subject of controversy. There have been reports of an increased risk of adverse events, such as femoral neck fracture, metallosis and pseudotumour, compared to conventional primary THA. These events are associated with early device failure. Despite these concerns, the available knowledge about resurfacing safety, particularly revision rates by prosthesis type, patient subgroup, and prosthesis placement, has not been reviewed.

Key Questions

1. What are the observed comparative rates of adverse events and complications for resurfacing and conventional THA in hip OA patients?
2. What are the comparative rates of early failure (revision or reoperation within 5 years) as a consequence of adverse events and complications for resurfacing and conventional THA in hip OA patients?
3. What are the rates of reporting post-operative component alignment and what is the percentage of resurfacing components reported as misaligned?

Methods

Databases Searched:

• MEDLINE, EMBASE, the Cochrane Library, BIOSIS, and Web of Science were searched from 1997 to January 2010. Searches were restricted to English language studies (in the case of THA, only clinical trials, cohort studies and case control studies were included). Next steps include searching the grey literature and scanning reference lists of included studies.

Inclusion criteria:

Population: adults (≥ 18 yrs) with primary osteoarthritis of the hip. In the case of a study population of hip and knee patients, only subdivided results were included.
Intervention: hip resurfacing and total hip arthroplasty.
Outcomes: adverse events, complications, safety issues and revision rates.

Abstract Review:

• 500 titles/abstracts identified in the literature search were double-reviewed with 98% agreement. The remaining abstracts were screened by one reviewer to determine relevance. Disagreements were resolved through consensus or consultation with a third reviewer.

Full-text Review:

• An Access database for data extraction was designed. One reviewer read each full-text study and determined relevance using the same criteria as above, with data from the included studies extracted to the database.

• Data extracted from each study includes: the type of prosthesis used, reported functional improvement, and patient subgroups (e.g. age, gender, per-operative diagnosis) that benefit most. The results presented here are a subset of the full list of outcomes.

Preliminary Results

As of June 10, 2011

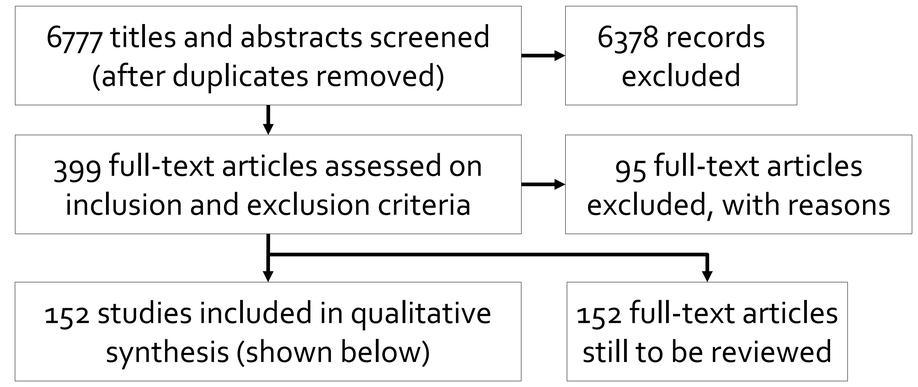
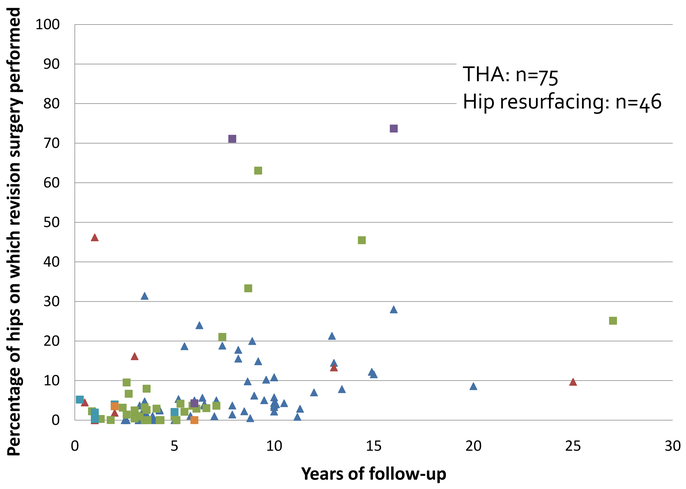


Fig 1. PRISMA diagram

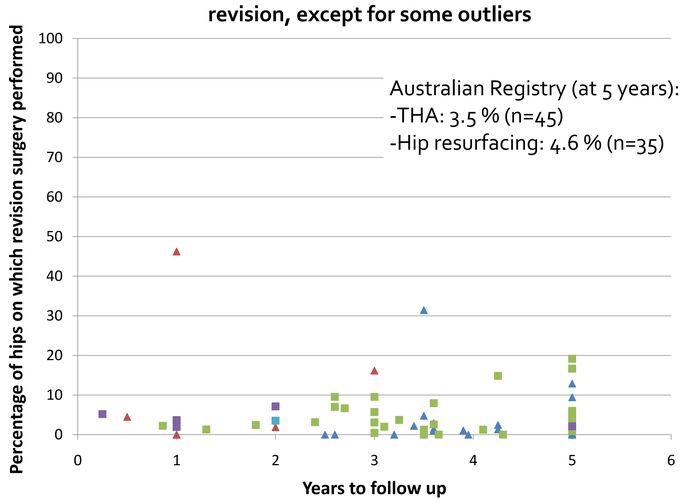
Revision Rates

• Key point: The THA revision rate is lower beyond 5 years



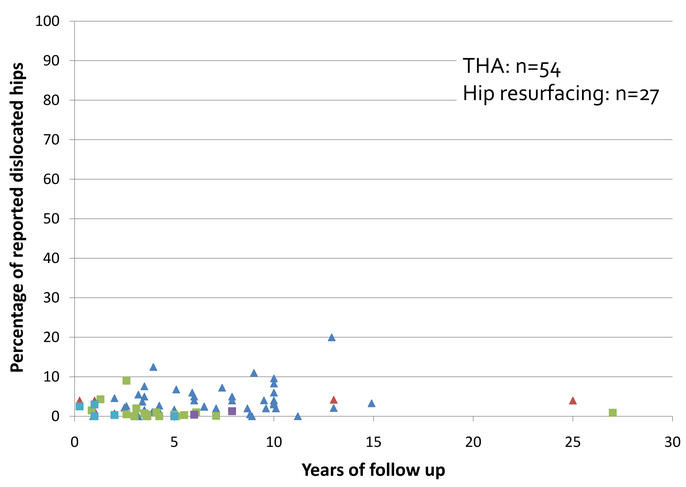
Early Failure (<5 years)

• Key point: THA and hip resurfacing perform similarly in early revision, except for some outliers

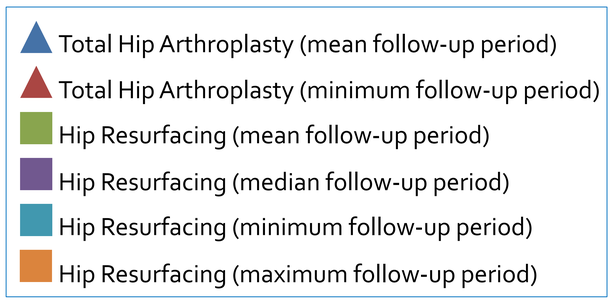


Dislocation

• Key point: A higher percentage of THA patients have dislocation



Legend



Note: Some of the outliers are devices that are no longer on the market. Final data analysis will differentiate between these devices.

Key Preliminary Findings

• Definitions of revision and reoperation (not shown) are not consistent in the literature.

• Beyond 5 years, the THA revision rate is generally lower than that of hip resurfacing when comparing historical hip resurfacing designs to THA. This finding may change when longer-term results of more contemporary hip resurfacing designs become available.

• Early revision rates are similar for THA and hip resurfacing, except for some outliers.

• There is a higher percentage of THA patients with dislocation.

This study was funded by a Canadian Institutes of Health Research and Canadian Arthritis Network Knowledge Transfer and Exchange Grant.