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[Intervention Review]

Surgery for thumb (trapeziometacarpal joint) osteoarthritis

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ABSTRACT

Background

Surgery is used to treat persistent pain and dysfunction at the base of the thumb when conservative management, such as splinting, or medical management, such as oral analgesics, is no longer adequate in reducing disability and pain. This is an update of a Cochrane Review first published in 2005.

Objectives

To assess the effects of different surgical techniques for trapeziometacarpal (thumb) osteoarthritis.

Search methods

We searched the following sources up to 08 August 2013: CENTRAL (*The Cochrane Library* 2013, Issue 8), MEDLINE (1950 to August 2013), EMBASE (1974 to August 2013), CINAHL (1982 to August 2013), Clinicaltrials.gov (to August 2013) and World Health Organization (WHO) Clinical Trials Portal (to August 2013).

Selection criteria

Randomised controlled trials (RCTs) or quasi-RCTs where the intervention was surgery for people with thumb osteoarthritis. Outcomes were pain, physical function, quality of life, patient global assessment, adverse events, treatment failure or trapeziometacarpal joint imaging.

Data collection and analysis

We used standard methodological procedures expected by the Cochrane Collaboration. Two review authors independently screened and included studies according to the inclusion criteria, assessed the risk of bias and extracted data, including adverse events.

Main results

We included 11 studies with 670 participants. Seven surgical procedures were identified (trapeziectomy with ligament reconstruction and tendon interposition (LRTI), trapeziectomy, trapeziectomy with ligament reconstruction, trapeziectomy with interpositional arthroplasty (IA), Artelon joint resurfacing, arthrodesis and Swanson joint replacement). We did not find any studies that compared surgery with sham surgery or surgery with non-surgical interventions.

Most included studies had an unclear risk of most biases which raises doubt about the results. No procedure demonstrated any superiority over another in terms of pain, physical function, quality of life, patient global assessment, adverse events, treatment failure (re-operation) or trapeziometacarpal joint imaging. One study demonstrated a difference in adverse events (mild-moderate swelling) between Artelon



joint replacement and trapeziectomy with tendon interposition. However, the quality of evidence was very low due to a high risk of bias and imprecision of results.

Low quality evidence suggests trapeziectomy with LRTI may not provide additional benefits or result in more adverse events over trapeziectomy alone. Mean pain (three studies, 162 participants) was 26 mm on a 0 to 100 mm VAS (0 is no pain) for trapeziectomy alone, trapeziectomy with LRTI reduced pain by a mean of 2.8 mm (95% confidence interval (CI) -9.8 to 4.2) or an absolute reduction of 3% (-10% to 4%). Mean physical function (three studies, 211 participants) was 31.1 points on a 0 to 100 point scale (0 is best physical function, or no disability) with trapeziectomy alone, trapeziectomy with LRTI resulted in sightly lower function scores (standardised mean difference 0.1, 95% CI -0.30 to 0.32), an equivalent to a worsening of 0.2 points (95% CI -5.8 to 6.1) on a 0 to 100 point scale (absolute decrease in function 0.03% (-0.83% to 0.88%)). Low quality evidence from four studies (328 participants) indicates that the mean number of adverse events was 10 per 100 participants for trapeziectomy alone, and 19 events per 100 participants for trapeziectomy with LRTI (RR 1.89, 95% CI 0.96 to 3.73) or an absolute risk increase of 9% (95% CI 0% to 28%). Low quality evidence from one study (42 participants) indicates that the mean scapho-metacarpal distance was 2.3 mm for the trapeziectomy alone group, trapeziectomy with LRTI resulted in a mean of 0.1 mm less distance (95% CI -0.81 to 0.61). None of the included trials reported global assessment, quality of life, and revision or re-operation rates.

Low-quality evidence from two small studies (51 participants) indicated that trapeziectomy with LRTI may not improve function or slow joint degeneration, or produce additional adverse events over trapeziectomy and ligament reconstruction.

We are uncertain of the benefits or harms of other surgical techniques due to the mostly low quality evidence from single studies and the low reporting rates of key outcomes. There was insufficient evidence to assess if trapeziectomy with LRTI had additional benefit over arthrodesis or trapeziectomy with IA. There was also insufficient evidence to assess if trapeziectomy with IA had any additional benefit over the Artelon joint implant, the Swanson joint replacement or trapeziectomy alone.

Authors' conclusions

We did not identify any studies that compared surgery to sham surgery or to non-operative treatments. We were unable to demonstrate that any technique confers a benefit over another technique in terms of pain and physical function. Furthermore, the included studies were not of high enough quality to provide conclusive evidence that the compared techniques provided equivalent outcomes.

PLAIN LANGUAGE SUMMARY

Surgery for osteoarthritis of the thumb

Background

Osteoarthritis is a disease of the joints, such as your knee or hip. Osteoarthritis at the base of the thumb (or trapeziometacarpal joint) may cause pain, stiffness and weakness in the thumb. This can affect how well the thumb moves, how strong a person's grip is, and how well a person can do routine things at home or at work. There are many types of surgery for the base of the thumb but they all have the same aim: to reduce pain and increase function (or reduce disability).

Study characteristics

Researchers from the Cochrane Collaboration examined the evidence for surgical treatment for osteoarthritis of the thumb. After searching for all relevant studies up to 8 August 2013, we included 11 studies (670 participants). Most participants were women with osteoarthritis who had inadequate relief with conservative measures, such as splinting, or oral analgesia such as paracetamol.

The most common technique used involved the removal of the trapezium bone at the base of the thumb (trapeziectomy) plus reconstruction of the ligament that holds the bones between the thumb and index finger together (ligament reconstruction) and filling the space left behind by the removed trapezium with spare tendon from the forearm to support the thumb (interpositional arthroplasty (IA); or commonly called 'trapeziectomy with LRTI'). Four studies (421 participants) compared this to the second most common procedure, trapeziectomy alone. Other studies compared trapeziectomy with LRTI to joint resurfacing (two studies, 113 people), arthrodesis (joint fusion; one study, 40 participants) or joint replacement (one study, 26 people). No studies included sham surgery as a comparison.

We chose trapeziectomy with LRTI versus trapeziectomy alone as our main comparison as these are the two most commonly performed procedures and were represented in the most studies (four studies).

Key results:

Trapeziectomy with LRTI versus trapeziectomy alone

Pain on a scale of 0 to 100 mm (lower scores mean reduced pain):

- People who underwent trapeziectomy with LRTI rated their pain to be 3 mm lower (10 mm lower to 4 mm higher) at three to 54 months of follow-up (3% absolute improvement) compared with people who had trapeziectomy alone;
- People who underwent trapeziectomy with LRTI rated their pain as 30 mm;



- People who underwent trapeziectomy alone rated their pain as 26 mm.

Physical function (0 to 100 point score, lower means less disability):

- People who underwent trapeziectomy with LRTI rated their disability as 0.03 points higher (0.83 points lower to 0.88 points higher) at seven to 97 months follow-up compared to people who had trapeziectomy alone;
- People who underwent trapeziectomy with LRTI rated their disability as 31 points;
- People who underwent trapeziectomy alone also rated their disability as 31 points.

Side effects

- Nine more people out of 100 (0 to 29 more people) who had trapeziectomy with LRTI experienced side effects (9% absolute increase in adverse events), compared with people who had trapeziectomy alone;
- 19 out of 100 people who had trapeziectomy with LRTI had an adverse event;
- 10 out of 100 who underwent trapeziectomy alone experienced an adverse event.

Single studies reported comparison between less commonly performed techniques that are reported in the main article.

Quality of the evidence

There is low-quality evidence that in people with thumb osteoarthritis, trapeziectomy with LRTI may not improve pain or function, or have less side effects than trapeziectomy alone. There was insufficient evidence to assess if trapeziectomy with LRTI had additional benefit over trapeziectomy with ligament reconstruction, arthrodesis or trapeziectomy with IA. There was also insufficient evidence to assess if trapeziectomy with IA had any additional benefit over the Artelon joint implant, the Swanson joint replacement or trapeziectomy alone.

Further research is likely to change the estimates of these results.

We are uncertain if any surgery has benefits compared to no surgery, non-surgical therapies or sham surgery as no studies were found assessing these comparisons.