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Trapeziectomy for basal thumb joint osteoarthritis: 3- to 19-year follow-up

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Abstract A consecutive series of 40 trapeziectomies in 30 patients with basal thumb joint osteoarthritis was reviewed. Sixteen thumbs had pan-trapezial and 24 thumbs trapeziometacarpal osteoarthritis. Simple excision without soft tissue interposition was performed by the same surgeon using an identical surgical technique. Twenty-eight patients were female (mean age 57 years) with a mean follow-up of 11 (3–19) years. Twenty-eight patients were satisfied with their operation, with 26 thumbs being pain free. Thumb pinch strength was improved by 40% compared to preoperative values, but still remained 22% weaker than the non-operated side.

Résumé Une série de 40 trapézectomies pour arthrose trapézo-métacarpienne est présentée. Il s'agit de 30 patients dont 28 de sexe féminin, d'âge moyen 57 ans, avec un suivi de 11 ans (3 à 19). L'arthrose était péri-trapézienne dans 16 cas et trapézo-métacarpienne dans 24 cas. Une simple ablation du trapèze a été fait san interposition tissulaire, par la même Chirurgien. 28 patients sont satisfaits de l'intervention avec une première colonne indolore dans 26 cas. La force de la pince polycidigitale a été améliorée de 40% comparé à l'état pré-opératoire mais reste plus faible que celle du côté non opéré.

Introduction

A number of surgical procedures have been described for basal thumb joint arthritis, with simple excision first reported in 1949 by Gervis [3]. Further papers have reported the results of simple excision of the trapezium [1, 2, 4, 5], trapeziectomy with silastic interposition [6, 7], and trapeziectomy with soft tissue interposition and ligament reconstruction [8, 9]. Other surgical procedures for osteoarthritis of the trapeziometacarpal joint include partial trapeziectomy and interpositional arthroplasty (soft tissue [10], silastic, and titanium), arthrodesis of the trapeziometacarpal joint [11], and total joint replacement [12].

The aim of this study was to review the long term results in a consecutive group of patients who underwent simple trapeziectomy without soft tissue interposition. All operations were performed by the same surgeon for pain and disability. In contrast to more recent reports on simple excision of the trapezium without soft tissue interposition [4, 5] preoperative measurements of pinch and grip strength were recorded.

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Patients and methods

We reviewed 30 patients who underwent 40 trapeziectomies (10 bilateral) between 1978 and 1994. Preoperative thumb pinch and hand grip strengths were recorded by the surgeon, and detailed preoperative records and radiographs were also available. Sixteen thumbs had evidence of pan-trapezial and 24 trapezio-metacarpal osteoarthritis.

All operations were performed under general anaesthetic using the same surgical technique. A dorso-radial longitudinal incision was made over the trapeziometacarpal joint with care not to damage the superficial radial nerve branches or radial vessels. Incision of the capsule of the 1st carpometacarpal joint was followed by sharp dissection of the trapezium with the aid of a towel clip. Soft tissue interposition or tendon reconstruction were not performed and K-wire fixation was not used. After closure a protective plaster slab was used until sutures were removed at 2 weeks after surgery.

Twenty-eight patients were female with a median age of 57 years (range 44–63). Follow-up from operation ranged from 3 to 19 years, with a mean follow-up of 11 years. Each patient was reviewed by 2 authors and asked if they were satisfied with their previous operation and whether they would have the operation again if need be. Patients recorded whether the thumbs were pain free, painful with use but not restricting activities, painful with use and restrictive, or whether rest pain was present. A further record of the effect of operation on the ability to perform manual tasks (see tables) was made.

Post-operative measurements of thumb pinch and hand grip strengths using a Jamar dynamometer and pinch meter were performed, and further radiographs taken. These were compared to the preoperative thumb pinch and hand grip measurements, and the radiographs compared with specific reference to further progression of osteoarthritic changes and measurement of the pseudarthrosis.

Fig. 1 Preoperative radiograph showing pan-trapezial osteoarthritis

Fig. 2 Radiograph of same patient seven years after simple excision of the trapezium

Results

Twenty-eight patients were satisfied with their operation, and 27 patients would be happy to have the operation again. One patient was dissatisfied due to pain at a 13 year follow-up, whilst the other felt there was no improvement of function at 14 years from operation.

Twenty-six thumbs out of 40 were pain-free at follow-up. Ten thumbs had some pain with use but did not restrict activities, whilst 2 thumbs had pain with or after use which restricted activities, and 2 thumbs had rest pain. The effect of the operation on a number of manual tasks was recorded, including turning keys, writing, handling coins and fastening buttons. The majority of patients recorded improvement in function or no disability post-operatively with the manual tasks (Table 1).

We compared the mean preoperative and post-operative strengths on the operated side only (40 thumbs). Thumb pinch strength was increased by 40% post-operatively, but there was no obvious difference in hand grip strength (Table 3).

Pinch and grip strength between the operated and non-operated side in 20 patients (10 bilateral cases) was also measured. There was a 22% and 10% decrease of pinch and grip strength respectively on the operated side (Table 2).

Four patients had post-operative complications. One developed an infection which was treated with antibiotics resulting in no long term problems. Another patient developed permanent sensory loss in the superficial radial nerve distribution, and 2 patients had altered sensitivity in the scar region which settled after approximately 6 months.

At follow-up repeat X-rays in 2 planes were taken in each case. The distance between the scaphoid and the thumb metacarpal was measured which represented the pseudarthrosis. The mean distance was 4 mm in 40 radiographs. In one case there was no gap but the patient had a pain-free thumb. Further degenerative changes of the distal scaphoid and base of the thumb metacarpal were seen in 8 patients.

Table 2 Comparison of operated and non-operated hands (mean kilograms force, *n*=20)

	Operated hand	Non-operated hand
Thumb pinch	4.4	5.6
Hand grasp	16	17.9

Table 3 Comparison of strength pre- and postoperative on same side (mean kilograms force. *n*=40)

	Pre-operative	Post-operative
Thumb pinch	3	4.9
Hand grasp	18	18

Table 1 Effect on manual tasks (40 operations)

	Handling coins	Writing[a]	Turning key	Fasten buttons
Improved	17	10	18	22
No change	1	2	4	1
Worsened	0	0	0	1
No disability	22	6	18	16

[a] dependent on dominant hand

Discussion

Simple excision of the trapezium has previously been described [1–5] with good results. With a mean follow-up of 11 years (range 3 to 19) we found that the majority of patients had long-lasting pain relief with 65% of thumbs being pain-free at follow-up.

Varley et al. [4] reported the results of simple excision in a comparable group of patients with a median age of 58 years and a mean follow-up of 5 years. We used a similar assessment of pain as the above authors, who showed 47% of thumbs being pain-free and 29% of thumbs slightly painful after use. Dhar et al. [5] with an average follow-up of 6 years after excision also reported 45% of patients with no pain. Nylen et al. [8] had similar results in 100 trapeziectomies with tendon interposition and ligament reconstruction, with 88% of patients satisfied with their operation and 49% completely pain-free. Menon [10] recorded a higher rate of complete pain relief (83% of operated thumbs) after partial trapeziectomy with tendon interposition but the mean follow-up was only after 4 years.

Murley [1] stated that simple excision produced weakness of hand grip in his series of patients. We compared pre- and post-operative measurements in this series and in contrast found no difference with hand grip, but a mean increase in thumb pinch strength by 40% on the operated thumb (40 thumbs). Comparison of the operated versus non-operated side in 20 patients showed a slight decrease in strength on the operated side (22% and 10% decrease of pinch and grip strength respectively). These were similar results to Varley who showed a 17% and 9% decrease in strength on the operated side, and Dhar who recorded a 16% and 21% decrease respectively.

Radiographs taken at follow-up showed a mean distance of 4 mm between the metacarpal base and scaphoid representing the pseudarthrosis. Eight patients showed further degenerative changes in the distal scaphoid and base of the thumb metacarpal but this was not present in the 2 patients with rest pain. The loss of height of the pseudarthrosis corresponded to the loss of length of the thumb.

Similar studies of excision with soft tissue interposition and ligament reconstruction have shown equally good results concerning pain relief and functional outcome [8–10] but are more technically demanding procedures. Excision and silastic interposition have also shown good results concerning pain relief, but silicone implant wear with resultant reactive synovitis and bone resorption are reported complications [6].

In this long term review of simple trapeziectomy good pain relief with a high level of patient satisfaction was found. Functional ability of the operated hand was also maintained, although loss of length of the thumb occurred corresponding to the pseudarthrosis. The thumb pinch strength was increased by 40% compared to preoperative values but no difference in hand grip strength was found. We therefore feel that simple trapeziectomy still remains as an acceptable treatment option in patients over 50 years of age for basal osteoarthritis of the thumb.

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