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Original article

Minimum 10-year clinical and radiological follow-up of trapeziectomy with interposition or suspensionplasty for basal thumb arthritis

G. Pomares*, D. Delgrande, F. Dap, G. Dautel

Service de chirurgie plastique et reconstructrice de l'appareil locomoteur, centre chirurgical Émile-Galle, CHU de Nancy, 49, rue Hermite, 54000 Nancy, France

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ABSTRACT

Hypothesis: The aim of this article is to analyze clinical and radiological outcomes of trapeziectomy performed for basal thumb arthritis after a minimum follow-up of 10 years to gain further insight from shorter and medium-term studies reporting satisfactory evolution.

Methods: We reviewed 67 trapeziectomies, operated on by the same senior surgeon after a minimum follow-up of 10 years. The sample included 16 cases of suspensionplasty and 51 interpositions. Clinical outcome evaluated strength, pain, joint amplitude, Kapandji opposition score, Disabilities of the Arm, Shoulder and Hand score, complications and revision surgery. Radiological evaluation criteria included osteoarthritis and collapse of the trapezoidal void.

Results: After a 10-year follow-up, clinical results remained stable despite radiological degradations. Long-term clinical outcomes of trapeziectomy for basal thumb arthritis are very positive, with interpositioning as an isolated procedure appearing, clinically, to be the preferred treatment despite greater radiological degradation when compared to suspensionplasty.

Conclusion: In addition to offering insight into minimum 10-year follow-up, this study also pinpoints this paradoxical dissociation of clinical-radiological outcomes.

Type of study/level of evidence: Therapeutic III.

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1. Introduction

Trapeziectomy is one of the classic surgical solutions proposed to patients suffering from basal thumb arthritis where non-operative medical treatment proves insufficient. Since the first procedures were performed in 1949 [1], the literature has continued to report adaptations striving to assure pain relief and to slow down the inevitable proximal migration of the first metacarpal (M1) leading to collapse of the trapezoidal void. For several authors [2–4], this collapse is responsible for increased pain and loss of strength. While the therapeutic arsenal – including interpositioning techniques, suspensionplasty, and synthetic implants – appears to give satisfactory clinical and radiological results on the short- and medium-term [5–7], these outcomes have only been evaluated up to a limit of 10 years [8,9]. The purpose of this study was thus to analyze after a minimum follow-up of 10 years clinical and radiological results of trapeziectomies with interposition or suspensionplasty performed for basal thumb arthritis.

2. Materials and methods

2.1. Patients

Our retrospective, monocentric study was carried out on patients having been operated on between September 1994 and November 2003 after a minimum follow-up of 10 years. Patients' files were first selected by a key word search in our Plastic and Reconstruction Surgery Service database of surgical reports. Criteria for inclusion were trapeziectomy for primary basal thumb arthritis, the availability of patients for clinical and radiological assessments at a minimum of 10 years postoperatively, and having been operated by the same senior surgeon. The criterion for exclusion was previous injury to the trapeziometacarpal joint. The institutional review board approved this retrospective study.

2.2. Technique

Surgery was performed under loco-regional anesthesia using a dorsal approach for all patients, excising the trapezium piecemeal after fragmentation by osteotome. In the interposition procedure, an “anchovy” was created from the palmaris longus tendon.

* Corresponding author. Tel.: +33 3 83 85 78 51.
E-mail address: germain.pomares@icloud.com (G. Pomares).

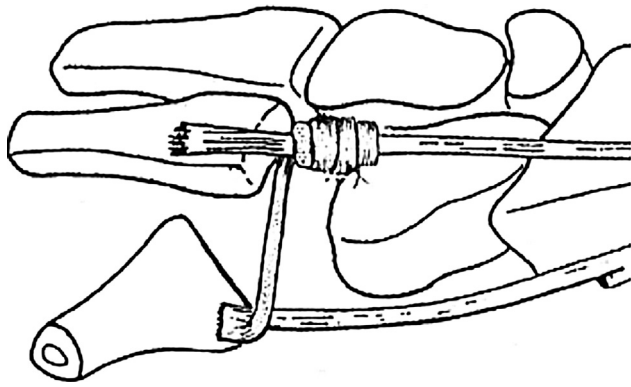


Fig. 1. The Thompson suspensionplasty [11]. A band of the abductor pollicis longus tendon laced around the flexor radialis carpi tendon.

Identified and isolated through a short incision in the wrist following the path of the tendon, it was then harvested with a tendon stripper [10]. By holding one end with Halsted forceps, the tendon was wrapped around itself. The spires were sutured together with PDS 4-0, thus forming a compact spherical spacer. At this point, the anchovy was secured in the void of the trapeziectomy site by closing the capsular plane with PDS 2.0 interrupted stitches. A suspensionplasty was performed using a band of the abductor pollicis longus tendon laced around the flexor radialis carpi tendon (Fig. 1), following Thompson's technique [11]. In the absence of the palmaris longus tendon, this suspensionplasty provided an alternative to interpositioning. Postoperative care included a hospital stay of 48 hours and 3 weeks of immobilization, with a resting splint supporting the wrist and the first phalanx of the thumb.

2.3. Methods

Clinical assessment included description of pain on the Visual Analog Scale (VAS), measurement of grip strength (Jamar and Key-Pinch in kgs), joint amplitude of the thumb column, Kapandji opposition score [12], quality of everyday life (measured by Disabilities of the Arm, Shoulder and Hand – Quick-DASH – score, subjective outcome satisfaction in terms of yes/no), and whether or not revision surgery had been necessary.

Radiological assessment measured the height of the trapezial void and the subluxation and proximal migration of the first metacarpal (M1), comparing preoperative, immediate postoperative and minimum 10-year follow-up radiographs. The occurrence of osteoarthritis (OA) on the thumb column joints was also recorded. X-rays consisted of frontal views of the hand and of Kapandji opposition [13]. From these, the height of the trapezial void was interpreted by measuring the distance between the most distal part of the scaphoid and the most proximal part of the M1. Proximal migration of the M1 was measured on the frontal views of the hand, evaluating the distance between the most proximal point of the base of the M1 and its orthogonal projection passing through the most proximal point of the bases of the second and fourth metacarpals (Fig. 2). Finally, subluxation of the M1 was evaluated on the frontal views of the hand, measuring the distance between the most radial point of the base of the M1 and its orthogonal projection on the tangent passing by the most radial edge of the radial epiphysis and the most radial point of the scaphoid tubercle (Fig. 3). The average of 3 assessments was for each radiographic criteria.

We analyzed clinical and radiological results by comparing the 2 treatment groups – interposition and suspensionplasty alone, respectively 51 and 16 – by means of JMP (SAS), at an α -level of



Fig. 2. Measuring proximal migration of the M1. Orthogonal projection from the most proximal point of the base of the M1 along the tangent to the most proximal points of the M2 and M4 bases.

0.05. Postoperative results were evaluated by means of a Khi^2 test, also at $P \leq 0.05$.

3. Results

One hundred and twenty patients were identified; 54 of them participated in the follow-up, representing 67 trapeziectomies performed over the 9-year period (Table 1). Not surprising in this pathology, our sample included 3 men for 51 women (4/63 surgeries). Mean age at the time of surgery was 58.1 (range 43–76) and 71.3 (55–89) at our review evaluation, the latter averaging 13.2 years (10–22). The right thumb was involved in 37 cases, the left in 30, in a sample strongly dominated by right-handed patients



Fig. 3. Measuring subluxation of the M1. Orthogonal projection from the most radial point of the base of the M1 along the tangent to the most radial points of the radial scaphoid and styloid.

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