



## Long-term outcome of trapeziectomy with ligament reconstruction and tendon interposition (LRTI) versus prosthesis arthroplasty for basal joint osteoarthritis of the thumb

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Several surgical techniques are available to treat thumb basal joint arthritis. In this study, we compare the long-term results of a thumb basal joint prosthesis (de la Caffinière or Roseland type prosthesis) with those of trapeziectomy with ligament reconstruction and tendon interposition (LRTI). We could not find any difference between both techniques with respect to impairment, pain reduction, patient satisfaction and disability.

**Keywords :** thumb ; osteoarthritis ; arthroplasty ; trapeziectomy ; ligament reconstruction ; tendon interposition.

### INTRODUCTION

Numerous techniques have been described for the surgical treatment of thumb basal joint arthritis. Two commonly used techniques are arthroplasty with a prosthesis (5) and trapeziectomy with ligament reconstruction and tendon interposition (LRTI) (1). The outcome of each technique has been studied extensively (3-17), but a comparison between their long-term results has rarely been reported. In a Cochrane Systematic Review (19), the authors concluded that, in view of no differences, the simplest technique – i.e. trapeziectomy – should be the first choice. A study by Ulrich-Vinther *et al* (18) compared prosthesis arthroplasty with LRTI at one year follow-up. They showed that joint replacement sur-

gery resulted in faster and better pain relief and a better functional outcome compared to tendon interposition arthroplasty, without an increased risk of complications. In this retrospective study we compare the long term outcomes of both techniques with a minimal follow-up of 9 years.

### PATIENTS AND METHODS

The study was designed as a single centre retrospective study. Between January 2000 and December 2010, 609 procedures in 519 patients, were performed: 450 LRTI's and 159 prostheses. To these patients a questionnaire was sent with a Quick DASH score, a Nelson Hospital score (NHS) (2), and visual analogue scores (VAS) for pain and satisfaction.

The response rate was 62% : 322 patients answered the questionnaire.

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From this group we excluded all bilateral cases, all males, all revision procedures and incomplete forms. We included all patients with a minimal follow-up of 9 years. This resulted in a cohort of 55 patients : 32 with an LRTI and 23 with a prosthesis.

There were no clear criteria regarding when to perform which procedure. The choice was left to the discretion of one of the two surgeons (ID and LDS) Two main exclusion criteria for the arthroplasty were an existing scaphotrapezotrapezoidal degeneration (for risks of persisting pain) and a trapezium height of less than 10 mm (for risks of fracture or perforation during cup placement).

**Surgical technique**

The technique used for LRTI was a modified Burton-Pellegrini procedure (1). Patients received a bulky dressing for two weeks. Mobilisation was allowed immediately.

For the arthroplasty, the technique described by de la Caffinière was used (5). We used the la Caffinière prosthesis (Stryker, Howmedica) until 2002, then we started to use the Roseland prosthesis (DePuy, Leeds, England) (13). Patients received a bulky dressing for two weeks. Mobilisation was allowed immediately.

**Evaluation**

Nelson hospital score (NHS) evaluates the impairment ; the maximum score is 100/100. The Quick DASH scores evaluates the disability from 0 (no disability) to 100 (major disability). The pain was scored on a visual analogue score 0 no pain, 10 severe pain. Satisfaction

was rated on a VAS : 0 not satisfied, 100 very satisfied. The groups were compared with the Student's T-test ; p < 0.05 was considered significant.

**RESULTS**

All patients were females with a mean age of 56 years (range : 41 to 79) In general most patients were satisfied, with a VAS for pain of 2.3 (SD 2.75), a VAS for satisfaction of 76 (SD 22.1), a Quick DASH of 29 (SD 26.1) and an NHS of 75 (SD 28.2).

We tried to make each group as homogenous as possible ; that is why males and bilateral cases were omitted.

The different data for the two groups separately are summarized in table I.

It is obvious that the outcome data are very similar in both groups. The age of the patients in the prosthesis group was significant lower than in the LRTI group. It is not clear if this could influence the outcome since the outcomes were not different for patients younger and those older than the mean age. The p-value for the Quick DASH is 1.0, for NHS 0.6, for VAS pain 0.8 and for VAS satisfaction 0.6 (Student's T-test).

**DISCUSSION**

Originally the LRTI procedure was described by Burton and Pellegrini (1). They showed excellent results in 92% of cases. Good long-term outcomes

Table I. — Summary data for the two procedures applied for osteoarthritis of the thumb. Only the age at operation was significantly different

	LRTI		Prosthesis		p value
	mean	SD	mean	SD	t-test unpaired
N	32		23		
Age at op (years)	58	8.6	53	6.3	0.02*
Follow-up	10.1 y (9-12)		10.5 y (9-16)		
Quick DASH	29	28	29	22.8	1
NHS	78	28.6	72	26.8	0.6
VAS pain	2.0	2.6	2.9	2.8	0.8
VAS satisfaction	76	28.1	72	32.0	0.6

were also reported (17). These results were reproduced by different authors. Nylen *et al* (15) showed good results in 88 of 100 patients. De Smet *et al* (7,10,11) showed a high satisfaction rate with good functional results in 26 out of 31 patients with this technique.

Results with the prosthesis were also reported in numerous articles. de la Caffinière (5) was probably first to develop an implant for thumb basal joint arthritis. He and others mentioned good results at short and at long term. This was confirmed in other studies (3,4,5,6,8,14). The Roseland prosthesis (13) also showed good functional results. Guardia *et al* (12) had a good functional outcome in 84.6% of cases. Schulh *et al* (16) mentioned good results with the Roseland prosthesis and a satisfaction rate of 78% of patients, although a high number of loosening was noticed (18). We had a success rate of 90.7% (9).

A long term comparison of outcome between both techniques has not yet been published. A study by Ulrich-Vinther *et al* (18) compared prosthesis with LRTI at 1 year follow-up. They showed that joint replacement surgery resulted in faster and better pain relief and a better functional outcome compared to tendon interposition arthroplasty, without an increased risk of complications. A meta-analysis (Cochrane library) (19) could not demonstrate a significant difference between the results of all surgical techniques used to treat basal joint arthritis of the thumb. This was also noted in a smaller study done at our institution (8).

This survey compares the long-term outcomes of LRTI and prosthesis for thumb basal joint arthritis. The minimal follow-up was 9 years. We did not find any difference between both techniques with respect to pain or function.

There are several limitations to this study. The patients were not randomized to LRTI or prosthesis arthroplasty; the study was retrospective, with unequal numbers of patients in both groups, and only female patients not undergoing bilateral surgery were included in the study. Two different prostheses were used, the la Caffinière prosthesis and the Roseland prosthesis. Finally our evaluation is based on patients' self-assessment and not on clinically measurable data. Prospective studies with

long term results are needed to address these shortcomings.

However, in view of these and other findings and of the increasing number of studies reporting component loosening, we no longer consider prosthesis arthroplasty as the first choice.

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