A three-step technique to correctly identify the trapezium without the need for fluoroscopic imaging

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Abstract Thumb pain secondary to degenerative arthritis of the carpometacarpal joint of the thumb is a common disabling condition. The key principles of successful basal joint arthroplasty involve trapezial excision, which is required for pain relief, with or without some form of ligament reconstruction. The majority of basal joint reconstructive procedures include partial or complete trapeziectomy, with and without some types of tendon transfer and ligament reconstruction and with or without tendon interposition and/or temporary wire stabilisation. When performing a trapeziectomy, it is important to identify the trapezium correctly before excising it. Excision of the incorrect bone during trapeziectomy for basal joint arthritis of the thumb has been reported within the NHS Litigation Authority database. We describe the senior author's routinely used three-step technique to confirm the identity of the trapezium before excision. This technique has been reliably used in over 300 cases with successful excision of the trapezium without intraoperative fluoroscopy.

Keywords Trapeziectomy · Carpometacarpal · Fluoroscopy · Technique · Identification

Introduction

Thumb pain secondary to degenerative arthritis of the carpometacarpal joint of the thumb (basal joint) is a

common disabling condition, affecting approximately 25 % of women and 8 % of men between the ages of 50 and 65 [2]. Management should in the first instance consist of consideration of conservative measures, including splintage, activity modification, nonsteroidal anti-inflammatory use and joint injection [3]. If these are not successful, surgical management may be appropriate. One method of surgical treatment of this condition is excision arthroplasty of the carpometacarpal joint. This encompasses a variety of operations including partial or complete trapeziectomy, with or without ligament reconstruction and with or without tendon interposition and/or temporary K wire stabilisation [2].

When performing a trapeziectomy, it is important to identify the trapezium correctly before excising it. This can be difficult, particularly if the operating surgeon is inexperienced. We are aware, anecdotally, of at least two cases in the UK where an incorrect bone has been excised during this procedure.

The NHS Litigation Authority has settled at least one such claim; a senior trainee performed the operation, but unfortunately the wrong bone was excised. The total settlement, including costs, of this claim (in 2004/2005) to the Authority, amounted to £112,000 [1].

Technique

The trapezium may reliably be identified by fluoroscopic imaging. However, this involves exposure of patients and staff to radiation and prolongs surgical time. The senior author routinely uses a three-step technique to

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Fig. 1 Thumb MCPJ flexed. From left to right: Red needle in metacarpal, blue in CMCJ, green in trapezium and blue in STTJ

confirm the identity of the trapezium before excision. This technique has been reliably used in over 300 cases. It is quick and easy and requires no additional equipment.

The three steps are the following:

1. Identify the first metacarpal base by the attachment of the abductor pollicis longus and by the fact that it is the only bone to move significantly on passive movement of the thumb. The trapezium will only move minimally if at all, even prior to soft tissue release (Figs. 1 and 2).

Fig. 2 Composite image of Fig. 1 but with thumb MCPJ extended. Note the excursion of the red needle (A) from original position in thumb MCPJ flexion on the left and new position with thumb MCPJ extension on the right (note the minimal movement of other needles in comparison to the original position)

Fig. 3 Confirmation that radial styloid (indicated by tip of McDonald's dissector) is proximal to the proximal margin of carpal bone identified as trapezium (outlined by dotted line)

2. Check that the whole of the bone to be excised lies distal to the tip of the radial styloid; if it does not, it must be the scaphoid (Fig. 3).
3. Identify the groove within the trapezium through which runs the flexor carpi radialis tendon (Fig. 4). The scaphoid does not have this groove.

Fig. 4 Flexor carpi radialis as it enters the groove in the trapezium. The blue needle runs into the groove alongside the FCR tendon (lifted up on McDonald's dissector)

We believe that this simple three-step technique is reliable and reproducible and helps to reduce the risk of excising the incorrect carpal bone and unnecessary exposure of staff and patients to X-ray radiation.

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