Carpal tunnel syndrome secondary to an accessory flexor digitorum superficialis muscle belly: case report and review of the literature

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Abstract Anomalous muscles usually do not cause symptoms but are of academic interest mainly discovered during cadaveric dissection. An aberrant muscle belly arising from the index finger flexor digitorum superficialis tendon causing carpal tunnel syndrome is rare. The management of such an anatomical variant is dependent on whether the median nerve compression is associated with a palpable mass. A brief case highlighting important management principles along with a complete literature review is reported.

Keywords Carpal tunnel · Median nerve · Anomaly · Accessory · Anatomical

Case Report

A 44-year-old right-handed female presented to the orthopaedic clinic with pain at the base of the radial side of her left thumb and paraesthesia in the radial two digits. She worked as a typist and her symptoms were aggravated by typing and gripping. Her symptoms were eased by shaking her hands. On examination she had decreased sensation to her left radial two digits. She had some weakness [grade 4/5 on the MRC scale] of the abductor pollicis brevis muscle. She had a positive Phalen's test at 8 s. Grind test to the left carpo-metacarpal joint was negative. Clinically, no masses were felt within the palm. Nerve conduction studies were organised which showed compression of the median nerve within the carpal tunnel with both

sensory and motor conduction delays. The patient was listed for a left carpal tunnel decompression.

Under local anaesthesia, an open approach was performed. The median nerve was found to be narrowed and compressed. There was an aberrant muscle attached to the index finger flexor digitorum superficialis [FDS] tendon within the carpal tunnel contributing to her symptoms (Fig. 1). No attempt was made to excise the muscle. Following the surgery, the patient's symptoms completely resolved at 3 months postoperatively.

Discussion

Carpal tunnel syndrome causes are broadly divided into three categories: those increasing the volume of the contents within the tunnel, those decreasing the volume of the tunnel and those related to a systemic condition. Median nerve compression within the carpal tunnel may be related to aberrant musculature, although uncommon, which effectively increases the contents of the tunnel [5, 7].

An aberrant FDS muscle of the index finger was first described by Mainland during a routine anatomical dissection

Fig. 1 Aberrant muscle belly arising from index finger FDS tendon (pointer)

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Table 1 Carpal tunnel syndrome cases caused by an Anomalous FDS muscle belly to the index finger

Case Number	Author	Age and gender	Clinical features	Nerve conduction studies	Treatment	Response
1	Smith (1971)	28 F	Pain radial 3 fingers with palpable mass	Not performed	TCL divided and muscle excised	Good
2	Hutton (1981)	23 F	Pain and paraesthesia thumb and radial 2 fingers. No masses	Negative	TCL divided and muscle excised	Good
3	Gleason (1982)	52 F	Numbness and tingling index and ring fingers. No masses	Positive	TCL divided and muscle excised	Good
4	Ametewee (1985)	23 F	Numbness and tingling thumb and radial 2 fingers. No masses	Negative	TCL divided and muscle freed from nerve but no excision	Good
5	Schon (1992)	26 M	Pain and numbness radial 3 fingers with palpable mass	Negative	TCL divided and muscle excised	Good

[6]. Butler reported the first case of an anomalous muscle within the palm causing carpal tunnel syndrome which was caused by an aberrant index finger lumbrical [2]. Aberrant musculature arising from the FDS tendon to the index finger is extremely rare with the first case being described by Vichare in a patient who presented with a palpable mass but no evidence of nerve compression [10].

The first case of an anomalous muscle belly arising from an index finger FDS tendon causing median nerve compression was described by Smith [9]. In this case, a palpable mass was also detected clinically and intraoperatively, the anomalous muscle belly was found to be compressing the median nerve against the transverse carpal ligament [TCL] and as well as dividing this ligament, the muscle belly was excised. Four further cases were then described and these are summarised in Table 1 [1, 3, 4, 8]. In all of these previous cases, the anomalous muscle belly was excised with the exception of the case reported by Ametewee [1].

We report only the second case where the anomalous muscle belly has been retained with a complete resolution of symptoms. Furthermore, with the exception of this case and those described by Hutton and Ametewee, patients with median nerve symptoms secondary to an anomalous FDS muscle initially presented with a mass rather than symptoms of median nerve compression [1, 4].

Conclusion

We conclude that this uncommon anatomical variant should be included as a possible cause for median nerve compression within the carpal tunnel. In our case, the aberrant muscle was not excised and release of the TCL alone was sufficient with complete resolution of symptoms and in cases where the mass is not palpable, then this is all that is required. In cases where the anomalous muscle belly is palpable with distal extension, then a wider exposure with direct visualisation of the nerve may be required to allow formal excision or dissection of the nerve from the accessory muscle to reduce the risk of recurrence or partial

relief postoperatively, which may result from direct pressure of the retained mass on the digital nerves to that finger.

Conflict of Interest Saqib Javed declares that he has no conflict of interest.

Michael Woodruff declares that he has no conflict of interest.

Statement of Human and Animal Rights This article does not contain any studies with human or animal subjects.

Statement of Informed Consent Statement of informed consent: patient is not identifiable from this report.

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