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Short Communication

Myth in hand surgery: When is an opponensplasty an abductorplasty?

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Dear Sir,

The thumb is unique in that it is capable of moving in multiple directions. This is due to the synchronised actions of the joints coordinated by the intrinsic and extrinsic muscles. Thumb opposition, a distinguishing human trait, encompasses three planes of thumb metacarpal movements: palmar abduction, flexion, and pronation. This primarily occurs through the trapeziometacarpal joint with contribution from the thumb metacarpophalangeal (MCP) joint. This is powered by the thenar muscles, of which the abductor pollicis brevis (APB) is the key. Its radial and superficial position confers a mechanical advantage despite its size. The radial head of the flexor pollicis brevis opposes the thumb to a lesser degree, whilst the opponens pollicis and volar slips of the abductor pollicis longus tendon, known as the digastric muscles of Wood, exerts the least effect.¹

Opponensplasty, originally described by Steindler (1917), is a salvage tendon transfer procedure to reanimate thumb opposition and restore tip and key pinch in median nerve palsy. Left untreated, it results in an externally rotated and supinated thumb with a hyperextended MCP joint, and first web space adduction contracture from unopposed deforming forces. The goal of the procedure is to restore the function of APB. Common tendon donors include the palmaris longus (PL) (Camitz, 1929), flexor digitorum superficialis (FDS) to the ring finger (Royle, 1937), extensor indicis proprius (EIP) (Burkhalter, 1973) and abductor digiti minimi (ADM) (Huber, 1921). The presence of multiple nerves

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or tendon injuries may preclude the use of certain donors. The donors are uniformly sutured to the APB insertion, at the abductor tubercle of the thumb proximal phalanx.

Various tendon transfers have been adapted to augment congenital hypoplastic thumbs regarding strength and stability. The FDS tendon to the ring finger is the most widely used donor. It is powerful and has a good excursion. Remnant of the tendon can be used to reconstruct the collateral ligaments with an unstable thumb MCP joint. The PL transfer, compared to others, functions more as a static rather than a dynamic reanimation. Thumb abduction occurs through tenodesis of the wrist. The advantages of this transfer are that PL is synergistic to the APB, but it can be congenitally absent.^{1,4} The Huber transfer may be preferred in children by some with the hope of restoring the thenar eminence bulk. However, the excursion of the ADM muscle is often limited by its vascular pedicle at the pivot point. This results in the obliteration of the natural palmar curvature and a potentially poorer aesthetic outcome.

The procedure is deemed successful if the predetermined functional requirement tailored to the individual is achieved. This relies on the tension that is set and the transfer's vector of pull, which in turn depends on where the donor tendon is sutured to and the location of the pulley if it is used. It is on this basis we feel the procedure should be so named. For true opposition, Bunnell (1938) had recommended that the ideal line of pull should be along a projected line from the pisiform to the thumb MCPJ and that the donor tendon should be sutured to the dorso-ulnar aspect of the MCPJ.² Various pulleys have been created on the ulnar side of the wrist. Despite so, the degree of thumb rotation may still be inadequate. Kato et al. and others have used a radial flexor retinacular pulley for Camitz transfers, which brought the PL tendon in line with the APB muscle fibres.³ They achieved better pinch and thumb pronation and less tendon bowstringing than compared to the traditional transfer. It also avoids compression of the median nerve in the distal forearm. Other authors have tried to augment thumb pronation by suturing the donor tendon to the dorso-radial aspect of the MCPJ or by creating a sling around the extensor mechanism. The latter has the added benefit of creating simultaneous MCP joint extension.

For congenital hypoplastic thumbs, restoring abduction is often more critical than opposition as most of the young patients have an acceptable amount of opposition but lack strong abduction and stability at the thumb MCP joint. For these reasons, several surgeons had objected to the term "opponensplasty." Kaplan and others felt that opponens pollicis is the least important muscle for thumb opposition, instead, they called it opposition tendon transfer.¹ We agree that opponensplasty is a misnomer. It is a confusing terminology that has been used interchangeably to describe the reanimation of opposition, abduction or a combination of movements without defining the true nature of the transfer. To restore each function, the line of pull and the requirement of the tendon transfer differs. This is determined by the bespoke need of the patient preoperatively. This underpins the success and ultimately the naming of the procedure regardless of the tendon used. Precise nomenclature gives clarity about the goal of surgery, improve communication and the assessment of surgical outcomes. We plea for the nomenclature to be corrected and to named after the function that is to be restored.

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