Evaluation of the use of Autologous Vein Graft for tendon sheath defects in Primary Flexor Tendon repair in zone II

Thesis

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Dedication

To the soul of my father.

To those who have always been there for me;

My mother & sister for their support and dedication.

My wife, for her love and constant encouragement.

And my son, Mohamed.

Thanks for your valuable support

LIST OF FIGURES

A1	First annular pulley
A2	Second annular pulley
A3	Third annular pulley
A4	Forth annular pulley
A5	Fifth annular pulley
ASSH	American Society for Surgery of the Hand
C1	First cruciform pulley
C2	Second cruciform pulley
C3	Third cruciform pulley
cm	Centimeter
CT	Computed tomography
DIP	Distal interphalangeal joint
E-PTFE	Expanded polytetrafluoroethylene
e.g.	exampli gratia (for example)
FDS	Flexor digitorum super cialis
FDP	Flexor digitorum profundus
FPL	Flexor pollicis longus
i.e.	istoes (that is to say)
IAPD	Intra-annular pulley distance
IP	Interphalangeal joint
Lt	Left
MA	Moment arm
MCP	Metacarpo phalangeal joint
mm	Millimeter
No.	Numéro (number)

PL	Palmaris longus
PIP	Proximal interphalangeal joint
PA	Palmar aponeurosis
ROM	Range of motion
Rt	Right
SD	Standard deviation
TAM	Total active motion
VLS	The viniculum longum superficialis
VLP	The vaniculum longum profundus
VBS	The veniculum brevis superficialis
VBP	The vinculum brevis profundus

Hand, Anatomy, Flexor Tendon, Zone II, Tenon Sheath, Biomechanics, Tendon Repair, Tendon rehabilitation.

INTRODUCTION AND AIM OF THE WORK

The functional biomechanics of the flexor tendons depend on a number of factors including an intact pulley system, synovial fluid, supple joints, and tendon excursion. An intact pulley system prevents flexor tendon bowstringing. The synovial fluid not only provides nutrients to the tendons but also is a constant source of lubrication, permitting frictionless gliding between the tendons. Adhesions among the tendons and other tissues restrict excursion ***(Paul et al., 2004).***

The zone (II) of the flexor tendons lies within the digital fibro-osseous tunnel and it's difficult to be repaired because the healing tendon tends to adhere to its fibro-osseous tunnel. It has been termed **"no man's land"** by Bunnell (1948) because of the poor outcome in range of motion following tendon repair ***(Chan et al., 2006)***. Repair ruptures, adhesion formations, and stiffness of finger joints remain frustrating problems in flexor tendon repairs and rehabilitation. Four approaches are suggested to improve the outcome of the repairs, which include stronger surgical repairs, appropriate pulleys or sheath management, optimization of rehabilitation regimens, and modern biological approaches ***(Tang, 2005).***

Nowadays, successful restoration of function following repair of lacerated flexor tendons in the digital sheath is one of the most difficult problems. The tethering effect of adhesions between the healing tendon and the surrounding structures blocks the gliding motion of the tendon. In comparison with wounds elsewhere in the body, a healing tendon repair should not only provide adequate tensile strength but also ensure a pliable scar around it for gliding purposes ***(Menon et al., 1985)***.

Adhesion formation after intrasynovial tendon injury represents a major clinical problem. Disruption of the synovial sheath at the time of the injury or surgery allows granulation tissue from surrounding tissue to invade the repair site resulting in adhesion formation ***(Sharma and Maffulli, 2005).*** It's logic to reestablish the continuity of the tendon sheath to improve tendon nourishment and prevent restrictive adhesion