



RBO
REVISTA BRASILEIRA DE ORTOPEDIA

www.rbo.org.br/



Original Article

Open Palm Technique in Dupuytren's Disease Treatment

Marcio Carpi Malta,^{1,*} Marcelo de Pinho Teixeira Alves,² Luis Marcelo de Azevedo Malta³

¹PhD; Associate Professor, Head of the Orthopedics Service, Hospital Universitário Antonio Pedro, Universidade Federal Fluminense, Niterói, RJ, Brazil.

²Master's in Medical Sciences from the Universidade Federal Fluminense, Niterói, RJ, Brazil.

³Physician of the Orthopedics Service, Hospital Universitário Antonio Pedro, Niterói, RJ, Brazil.

Research carried out in the Hospital Universitário Antonio Pedro, Universidade Federal Fluminense, Niterói, RJ, Brazil.

ARTICLE INFO

Article history:

Received on April 22, 2012

Accepted on July 3, 2012

Keywords:

Dupuytren contracture

Surgical procedures

Operative hand deformities

A B S T R A C T

Objective: To evaluate the results of the open palm technique for the treatment of Dupuytren's disease. **Method:** The authors used the technique described by McCash. Twelve patients (13 hands) were surgically treated, between October 2002 and September 2011. **Results:** The wounds healed in a medium of 25 days (variation of 17 to 30 days). There were no complications, such as infection, haematoma formation, skin necrosis, residual edema. **Conclusion:** The open palm technique remains a safe alternative for the treatment of Dupuytren's disease, with satisfactory results and low risk of complications.

© 2013 Sociedade Brasileira de Ortopedia e Traumatologia. Published by Elsevier Editora Ltda. All rights reserved.

*Corresponding author at: Hospital Universitário Antonio Pedro, Serviço de Ortopedia, Av. Marquês de Paraná, 303, 4º andar, Niterói, RJ, Brazil. CEP: 24033-900.

E-mail: marceloptalves@hotmail.com; malta@predialnet.com.br

Introduction

Palm aponeurosis, also known as Dupuytren's disease, was initially described by Felix Platter in 1614.¹ However, according to Rayan,² Dupuytren was responsible for describing the anatomical characteristics of the disease that remains named after him in 1831.

The disease is most common in Caucasian men. It is more prevalent in North America than in South America, and it is rare in China and Africa.³ Reis and Mota Júnior⁴ demonstrated a relationship between Dupuytren's disease and diabetes.

Myofibroblasts, a cell type described by Gabbiani and Majno⁵, have the morphological characteristics of fibroblasts and smooth muscle cells, and they are currently considered the determinant of Dupuytren's disease.

Although recent research has suggested the local administration of substances such as collagenase⁶ and corticosteroids⁷ for the non-surgical treatment of Dupuytren's disease, surgery is still the most used method.

Among the several surgical techniques employed to treat Dupuytren's disease, the one described by McCash is characterized by its simplicity and low rate of complications.⁸

This report evaluated the results obtained in patients suffering from Dupuytren's disease who were treated with the open palm technique.

Method

From October 2002 to September 2011, 12 patients (13 hands) suffering from Dupuytren's disease underwent surgery. The patients' ages ranged from 33 to 81 years old (average

64 years old). Two patients were female (17%), and one was of African descent (8%; the patient considered him/herself a Caucasian). Of the 13 hands that underwent surgery, 6 were (46%) left hands, and 7 were right hands (54%).

A single finger was affected in 69% of the hands (nine cases). Of these cases, 56% were on finger IV (on five hands), and 44% were on finger V (four hands). Two fingers were affected in four cases (31%), including fingers IV and V (two hands), III + IV (25%) and I + V (25%). Patient 5 had finger V involvement on both hands (the only bilateral case in our sample). In general, fingers I and III were affected in 8% of the hands, finger IV in 54%, and finger V in 54%.

Flexion deformity of the metacarpophalangeal joint greater than 30 degrees and/or deformity of the proximal interphalangeal joint greater than 15 degrees were present in all hands that underwent surgery. Chart 1 shows the general data of the patients.

All patients underwent surgery under block anesthesia with member ischemia.

The surgical technique used was previously described by McCash. The affected tissue was removed through a transverse incision in the region of the distal palm crease, which allowed the correction of the flexion deformity of the metacarpophalangeal joint. When necessary, another transverse incision was performed proximally to the first to facilitate the resection of the affected tissue. Figs. 1 to 5 illustrate the clinical case of patient number 2. As shown in Figs. 1 and 2, a flexion contracture was present in finger IV with a clearly observable longitudinal cord. Fig. 3 shows the access pathway used in the McCash technique, and the pathological tissue is evident. Figs. 4 and 5 demonstrate the postoperative evolution of the wound, with complete healing 25 days after

Chart 1 – General patient data.

Patient	Age (years)	Side	Finger(s) Affected	Surgery Date
1	71	Left	IV	10/05/2002
2	71	Left	IV	12/09/2003
3	63	Right	IV	12/02/2004
4	67	Right	I, V	01/20/2005
5	69	Right	V	02/16/2005
6	69	Left	V	04/08/2005
7	72	Right	V	08/26/2005
8	33	Right	IV	09/06/2005
9	54	Left	V	05/10/2006
10	72	Right	IV	10/28/2008
11	59	Left	IV, V	08/31/2010
12	81	Left	III, IV	05/19/2011
13	59	Right	IV, V	09/08/2011
Mean	65			
Percentage	Left	46%	I	8%
	Right	54%	III	8%
			IV	54%
			V	54%



Fig. 1 - Patient number 2, preoperative. Finger IV affected, anteroposterior view.

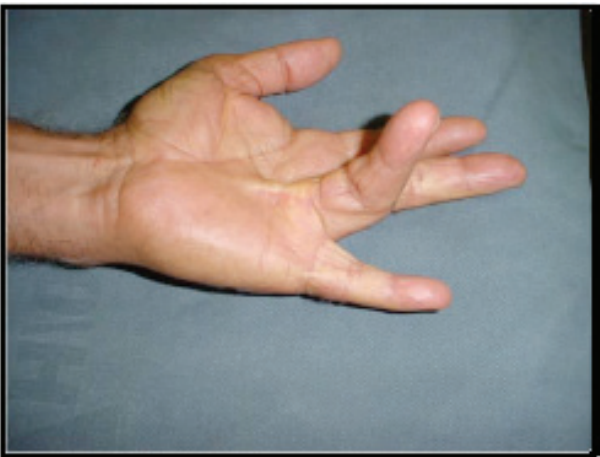


Fig. 2 - Patient number 2, preoperative. Finger IV affected, profile view.



Fig. 3 - Patient number 2, perioperative, with identification of the longitudinal cord.

the surgery and the absence of functional restriction of the patient's hand.

In three digitus annularis and three little fingers, the flexion deformity of the proximal interphalangeal joint was due to a disease nodule located at the proximal digital crease. In these cases, the nodule was resected through a transverse incision at the proximal digital crease. After removal of the tourniquet, the hemostasy revision was performed, and the open wounds remained, including those on the digitals, when present; the hand was immobilized with a plaster splint, and the fingers were kept stretched. The splint was removed on the fifth postoperative day and replaced by a dry gauze bandage covered by a crepe bandage. The patients were then advised to actively move their fingers, and the bandage was replaced weekly until the wounds closed.



Fig. 4 - Patient number 2, 25 days postoperative, with complete extension of the finger.



Fig. 5 - Patient number 2, 25 days postoperative, with finger in flexion, demonstrating pulp-palm with minimum functional deficit.

Results

The wounds closed in an average period of 25 days, with a range of 17 to 30 days (Table 1). Infection, hematoma, skin necrosis, residual edema, and other local complications were not reported. In 12 hands (92% of the patients), the deformities were completely corrected, with no limitation of the arc of movement of the joints involved at the end of treatment.

In one of the patients (8%) with unilateral disease, the flexion deformity of the proximal interphalangeal joint of finger V exceeded 90 degrees and was treated by resection of the fibrous tissue through a skin incision and multiple z-plasty. The palmar wound was left open and healed in 22 days, but the deformity of the proximal interphalangeal joint was not corrected.

Considering the severity of the deformity and the functional aspect of the hand, finger V was amputated after receiving the patient's approval.

Table 1 – The time required for wound closure for each patient.

Patient	Closure Time (days)
1	17
2	25
3	27
4	23
5	28
5	25
7	25
8	30
9	22
10	26
11	29
12	25
13	27
Mean	25

Discussion

Dupuytren's disease is associated with the presence and activity of myofibroblasts, which have the features of both fibroblasts and smooth muscle cells following differentiation. They were originally described by Gabbiani and Majno⁵ and later studied by Tomasek et al.⁹ Myofibroblasts produce the glycoprotein fibronectin, which binds the cells together and to the extracellular matrix of the stroma. This process, which is associated with the contracture capacity of these cells, results in the formation of nodules and cords in the palm and digital

aponeuroses and in the development of flexion deformity of the proximal interphalangeal and metacarpophalangeal joints, which together characterize Dupuytren's disease.^{10,11}

To treat Dupuytren's disease, the literature suggests several methods, including the local injection of agents such as calcium-channel blockers 9 (verapamil and nifedipine)¹² and lytic enzymes (trypsin and hyaluronidase) in combination with the placement of the fingers in forced extension to liberate the adhesions.¹³ Surgical treatment is the most used method, and it is indicated when the flexion deformities of the proximal interphalangeal and metacarpophalangeal joints exceed 30 and 15 degrees, respectively.

Some authors recommend percutaneous needle fasciotomy as a minimally invasive procedure for treatment of the disease.¹⁴⁻¹⁷ However, these studies have demonstrated a higher rate of recurrence after this type of procedure, which makes it more appropriate for elderly patients or patients who accept a possible early recurrence of the disease and, eventually, the deformity.¹⁵

All patients included in this study were surgically treated with the open palm technique. In 1984, one of the authors¹⁸ (MCM) published a study of 10 patients (total of 16 hands) with Dupuytren's disease who underwent surgery using the open palm technique; that study demonstrated results similar to those presented herein. As reported by Schneider et al.¹⁹ in a review of 49 patients, the open hand technique results in a less painful postoperative period, better mobility of the fingers, and a lower rate of complications. Lubahn recommended this technique and reported a complication rate of 8% in the initial postoperative period, without infections. In the long term, Lubahn reported that 20% of patients experienced residual contracture compared to 42% for patients treated by suturing the operative wounds.^{20,21}

Galbiatti et al.²² reported satisfactory results in the treatment of nine patients with the use of a straight incision in the palm of the hand, which was transformed during z-plasty when the wound was closed. All patients were male with a mean age of 54.2 years old, and 77% were Caucasian. In our study, we obtained similar results, without any concern for skin suturing.

Freitas et al.²³ observed ten patients treated with the open palm technique and verified that the average period for wound closure was 25 days, with a range of 15 to 45 days. In a sample of 30 patients, Silva et al.²⁴ found the same average duration for closure, but they reported a range of 20 to 40 days. Among our patients, the average time to closure was 25 days, with a range of 17 to 30 days, which is in general accordance with the literature. A similar finding was observed by Skoff, who reported an average of 40 days to wound closure in patients who underwent open palm surgery. In addition, he observed the complete correction of flexion deformities of the proximal interphalangeal and metacarpophalangeal joints.²⁵

In an analysis of 100 patients with a mean age of 52 years, including 88 men, Barros et al.²⁶ found that the digitus annularis (finger IV) and the little finger (finger V) were affected in 60% of cases and that the thumb (finger I) was involved in 25%. We observed a similar distribution, with fingers IV and V being the most commonly involved.

In one of our patients, flexion deformity of the proximal interphalangeal joints exceeded 90 degrees and could not be corrected with z-plasty. After palmar wound closure, the little finger was amputated for functional reasons.

Conclusion

We conclude that the open palm technique is a safe option to treat Dupuytren's disease and that it offers satisfactory results with low complication rates.

Conflict of Interest

The authors have no conflict of interest to declare associated with this paper.

REFERENCES

1. Elliot D. The early history of Dupuytren's disease. *Hand Clin.* 1999;15(1):1-19.
2. Rayan GM. Instructional course lecture. Dupuytren disease: anatomy, pathology, presentation, and treatment. *J Bone Joint Surg Am.* 2007;89(1):190-8.
3. Hueston JT. Dupuytren's diathesis. In: Hueston JT (Ed.). *Dupuytren's contracture.* Edinburgh: Livingstone, 1963, p. 51-63, E45.
4. Reis AS, Mota Júnior SC. Diabetes melito na etiologia da doença de Dupuytren. *Rev Bras Ortop.* 1993;28(5):329-31.
5. Gabbiani G, Majno G. Dupuytren's contracture: fibroblast contraction? An ultrastructural study. *Am J Patol.* 1972;66(1):131-46.
6. Badalamente MA, Hurst LC. Enzyme injection as nonsurgical treatment of Dupuytren's disease. *J Hand Surg Am.* 2000;25(4):629-36.
7. Ketchum LD, Donahue TK. The injection of nodules of Dupuytren's disease with triamcinolone acetate. *J Hand Surg Am.* 2000;25(6):1557-62.
8. McCash CR. The open palm technique in Dupuytren's contracture. *Br J Plast Surg.* 1964;17:271-80.
9. Tomasek JJ, Gabbiani G, Hinz B, Chaponnier C, Brown RA. Myofibroblasts and mechano-regulation of connective tissue remodelling. *Nat Rev Mol Cell Biol.* 2002;3(5):349-63.
10. Tomasek JJ, Rayan GM. Correlation of alpha-smooth muscle actin expression and contraction in Dupuytren's disease fibroblasts. *J Hand Surg Am.* 1995;20(3):450-5.
11. Tomasek JJ, Haaksama CJ. Fibronectin filaments and actin microfilaments are organized into a fibronexus in Dupuytren's diseased tissue. *Anat Rec.* 1991;230(2):175-82.
12. Rayan GM, Parizi M, Tomasek JJ. Pharmacologic regulation of Dupuytren's fibroblast contraction in vitro. *J Hand Surg Am.* 1996;21(6):1065-70.
13. McCarthy DM. The long-term results of enzymic fasciotomy. *J Hand Surg Br.* 1992;17(3):356.
14. Becker GW, Davis TR. The outcome of surgical treatments for primary Dupuytren's disease - A systematic review. *J Hand Surg Eur.* 2010;35(8):623-6.
15. Van Rijssen AL, der Linden H, Werker PM. Five-year results of a randomized clinical trial on treatment in Dupuytren's disease: percutaneous needle fasciotomy versus limited fasciectomy. *Plast Reconstr Surg.* 2012;129(2):469-77.
16. Van Demark RE Jr, Van Demark RE 3rd. Needle aponeurotomy: a treatment alternative for Dupuytren's disease. *S D Med.* 2011;64(11):411-5.
17. Pess GM, Pess RM, Pess RA. Results of needle aponeurotomy for Dupuytren contracture in over 1000 fingers. *J Hand Surg Am.* 2012;37(4):651-6.
18. Malta MC, Vianna SE, Schott PC. A técnica de palma aberta na contratura de Dupuytren. *Rev Bras Ortop.* 1984;19(2):46-8.
19. Schneider LH, Hankin FM, Eisenberg T. Surgery of Dupuytren's disease: a review of the open palm method. *J Hand Surg Am.* 1986;11(1):23-7.
20. Lubahn JD. Open-palm technique and soft-tissue coverage in Dupuytren's disease. *Hand Clin.* 1999;15(1):127-36.
21. Lubahn JD, Lister GD, Wolfe T. Fasciectomy and Dupuytren's disease: a comparison between the openpalm technique and wound closure. *J Hand Surg Am.* 1984;9A(1):53-8.
22. Galbiatti JA, Fiori JM, Mansano RT, Durigan Júnior A. Tratamento da doença de Dupuytren pela técnica de incisão longitudinal reta, complementada com Z-plastia. *Rev Bras Ortop.* 1995;30(4):207-12.
23. Freitas AD, Pardini Júnior AG, Filho ATN. Contratura de Dupuytren: tratamento pela técnica da palma aberta. *Rev Bras Ortop.* 1997;32(4):301-4.
24. Silva JB, Fernandes H, Fridman M. A técnica da palma aberta na contratura grave de Dupuytren. *Rev Bras Ortop.* 1999;34(1):51-4.
25. Skoff HD. The surgical treatment of Dupuytren's contracture: a synthesis of techniques. *Plast Reconstr Surg.* 2004;113(2):540-4.
26. Barros F, Barros A, Almeida SF. Enfermidade de Dupuytren: avaliação de 100 casos. *Rev Bras Ortop.* 1997;32(3):177-83.