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Surgical Outcomes and Complications in Patients with Early-Stage Dupuytren's Contractures

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ABSTRACT

Aim: This study aimed to assess the functional outcomes and complications of patients operated on for early-stage Dupuytren's contracture.

Patients and Methods: We retrospectively included 40 patients who presented to our clinic with early-stage Dupuytren's contracture. Age, sex, involved hand and finger(s), and contracture grade were assessed. All patients were examined for concurrent trigger finger, penile curvature, or plantar flexion contracture of the foot. The study involved patients with painful nodules and contractures of 0-45 degrees at the metacarpophalangeal joint.

Results: A total of 52 hands of 40 patients (24 men, 16 women; mean age: 57.6 years) underwent partial fasciectomy. The contractures were located in the right hand in 12 cases; left hand in 16; and both hands in 12; they were located in the fourth finger in 10 hands; fifth finger in 6 hands; fourth and fifth fingers in 12 hands; and along with third, fourth and fifth fingers in 24 hands. The mean follow-up period was 25.9 (range 2-100) months. No patient developed infection, hematoma, skin necrosis, nerve or vessel cuts postoperatively. Three patients had an opening of the sutures which were left to secondary healing. No patient was re-operated for Dupuytren's contracture. Trigger finger was observed in 7 (17.5%) patients and accompanying plantar fibromatosis in 4 (10%) patients.

Conclusion: Early surgery for Dupuytren's contracture can achieve high surgical success and low complication rates. Surgery performed when adhesions to the skin and adjacent tissues and skin contracture are mild has been shown to reduce re-operation rate.

Keywords: Dupuytren; contracture; palmar; fascia; fibromatosis

Erken Evre Dupuytren Kontraktürü Olan Hastalarda Cerrahi Sonuç ve Komplikasyonlar

ÖZET

Amaç: Bu çalışmada erken evre Dupuytren kontraktürü nedeniyle ameliyat edilen hastalar incelenip fonksiyonel sonuç ve komplikasyonların değerlendirilmesi amaçlanmıştır.

Hastalar ve Yöntem: Kliniğimize erken evre Dupuytren kontraktürü nedeniyle başvuran 40 hasta retrospektif olarak incelendi. Hastaların yaş, cinsiyet, hangi el ve elde hangi parmakların etkilendiği, kontraktür derecesi irdelendi. Beraberinde tetik parmak, penil kontraktür veya ayakta plantar kontraktür varlığı açısından incelendi. Çalışmaya ağrılı nodülleri olan ve metakarpofalangeal eklemde 0-45 derece kontraktürü olan hastalar dahil edildi. Daha ciddi kontraktürü olan hastalar çalışmaya dahil edilmedi.

Bulgular: 40 hastada (24 erkek, 16 kadın; ortalama yaş: 57.6) toplam 52 elde parsiyel fasciektomi yapıldı. Vakaların 12'si sağ elde; 16'sı sol elde; 12'si bilateral olarak raporlandı. 10 elde dördüncü parmakta, 6 elde beşinci parmakta, 12 elde dört ve beşinci parmakta 24 elde ise üç, dört ve beşinci parmak trasesinde kontraktür mevcut idi. MP eklemde Ortalama cilt kontraktürü 14,2 derece idi. Hastalar ortalama 25,9 (2-100) ay takip edildi. Hastaların postoperatif dönemde hiçbirinde enfeksiyon, hematom, cilt nekrozu ve sinir ya da damar kesilmesi görülmedi. 3 hastada sütür açılması görüldü, ikincil iyileşmeye bırakıldı. Hiçbir hasta elde Dupuytren kontraktürü nedeniyle tekrar ameliyat edilmedi. Tetik parmak 7 hastada(%17.5) eş zamanlı olarak görüldü. 4(%10) hastada aynı zamanda plantar fibromatozis mevcut idi.

Sonuç: Erken dönemde yapılan Dupuytren kontraktürü cerrahisinde yüksek cerrahi başarı ve düşük komplikasyon oranı elde edilebilir. Ayrıca, cilde ve etraftaki dokulara yapışıklığın az olduğu dönemde yapılan cerrahinin re-operasyon oranını azalttığı görülmüştür.

Anahtar kelimeler: dupuytren; kontraktür; palmar; fasya; fibromatozis

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Dupuytren's contracture is a disease state characterized by benign proliferation of the digito-palmar fascia on the palmar surface of the hand and the flexor aspect of the fingers. It manifests with flexion contractures in the hand as a result of the thickened palmar aponeurosis. Although its etiology is not entirely clear, a positive family history and different incidences across populations suggest a genetic transmission. Studies have shown an increased prevalence with certain conditions such as alcoholism and smoking, renal and hepatic disorders, and diabetes. Whereas it is frequent in Northern European and Scandinavian populations, it is less common in Asian and African countries. In Japanese, the disease starts later and progresses more slowly. This suggests a genetic influence on the condition (1,2). Dupuytren disease typically begins 10 years earlier and has a more severe natural course in men than in women, in whom contractures often develop more slowly and later in life. Contractures are usually found bilaterally; when they are unilateral, the condition has a milder course. The clinical course is more severe among alcoholics and patients with epilepsy than patients with a trauma history (2-4).

Dupuytren's contracture is diagnosed on clinical grounds. Various classification schemes have been defined to grade Dupuytren's contracture. Tubiana's classification is a commonly used clinical classification system for Dupuytren's contracture (1).

Patients and Materials

The medical information of 40 patients who presented to our clinic with early-stage Dupuytren's contracture was retrospectively reviewed. Age, sex, family history, involved hand and finger(s), and contracture grade were assessed. Patients were examined for the presence of trigger finger, penile curvature, or plantarflexion contracture of the foot. The study used the Tubiana grading to select patients with painful nodules and grade 1 (contractures of 0-45 degrees) contractures of the metacarpophalangeal (MCP) joint. Patients with more severe contractures involving digits and proximal interphalangeal (PIP) joints were excluded.

Surgical technique

All surgeries were performed under tumescent local anesthesia infiltrated to a wide area or under general anesthesia. Ten minutes after achieving local anesthesia using epinephrine, superficial palmar fascia leading toward the third, fourth, and fifth fingers was excised. Then, partial fasciectomy was performed using Bruner zig-zag incisions in cases with mild skin contractures and multiple Z-plasties in those with moderately severe skin contractures. The bands traversing toward tendons were freed using blunt and sharp dissections while preserving neurovascular structures. After achieving hemostasis, a Penrose drain was placed and the skin was closed with 4/0 non-absorbable sutures (Fig. 1).

Results

Partial fasciectomy was carried out in a total of 52 hands of 40 patients (24 men, 16 women). The mean age was 57.6 (36-82) years. Contractures were located in the right hand in 12 cases; left hand in 16; and both hands in 12. They were located to the fourth finger in 10 hands; fifth finger in 6 hands; fourth and fifth fingers in 12 hands; and along third, fourth and fifth fingers in 24 hands. The patients were followed for a mean of 25.9 (2-100) months. None of the patients suffered infection, hematoma, skin necrosis, or nervous or vascular injury postoperatively. Three patients had an opening of sutures which were left to secondary healing. The most common accompanying condition was trigger finger (7 patients (%17.5)), which was corrected at the operation. Penile curvature was not observed in any patient. Four (10%) patients had concurrent plantar fibromatosis. All specimens sent to histopathological examination were reported to contain palmar fibromatosis (Fig. 2).

Discussion

Although the exact underlying cause of Dupuytren's contracture cannot be explained, mechanisms related to connective tissue and cellular changes occurring in its histopathology have been well explained. It is generally argued that Dupuytren disease is characterized by an uncontrolled increase of collagen III and extracellular matrix. Luck et al (5) divided the disease into three phases, namely proliferative, involutional, and residual phases. In the proliferative phase, myofibroblasts begin to show a dramatic increase. These nodules expand toward the surface, replace subcutaneous fat tissue, and adhere to deep layers of the skin. In the involutional phase, nodules become smaller and firmer along the longitudinal axis, mostly on the ulnar side. The condition's progress is characterized by the formation of cords by the organization of the abnormal connective tissue and Type 3 collagen accumulation.

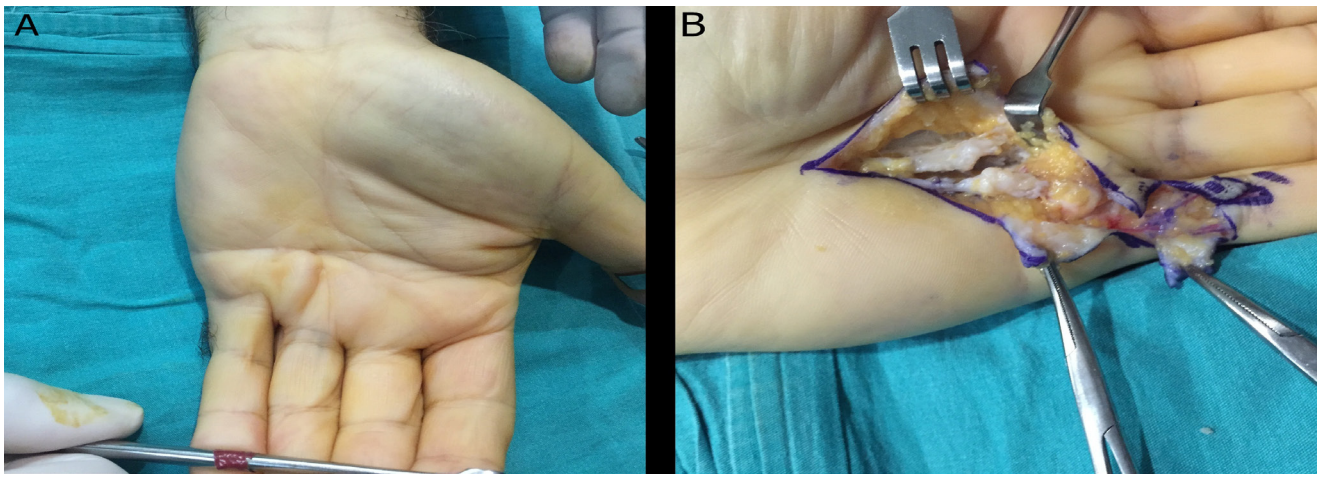

Figure 1: A: A 65-year-old patient with a Dupuytren's contracture extending from the palm to the PIP joints of the 4th and 5th fingers. B: The contractures were opened with Z-plasties. A partial fasciectomy was performed.

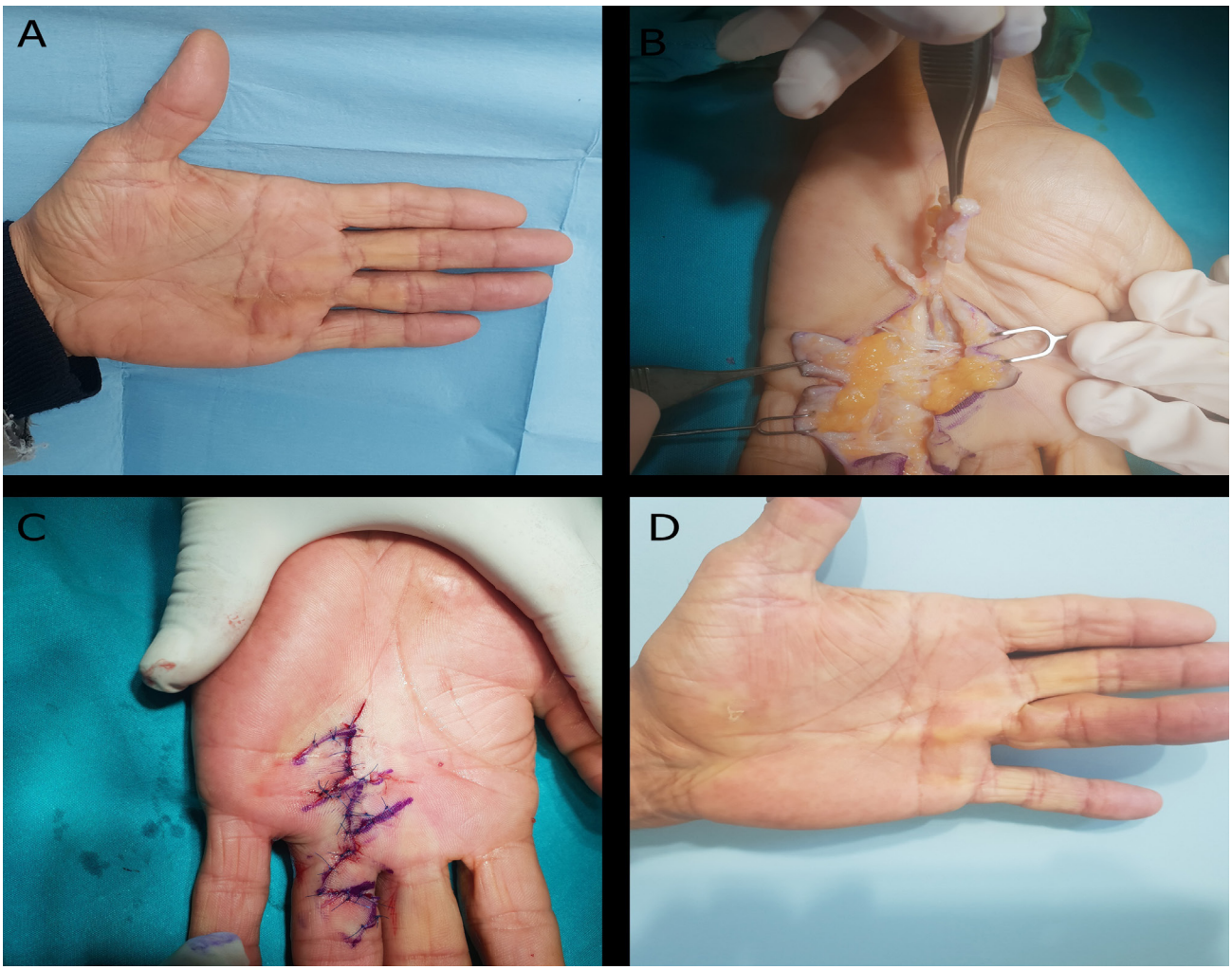

Figure 2: A 56-year-old patient with palmar fibromatosis causing a flexion contracture of approximately 30 degrees that extended from the palm to the PIP joint of the fourth finger. A: The front view of the Dupuytren contracture. B: Palmar fibromatosis cords (intraoperative view). C: The area was cleared off the contractures with multiple Z-plasties. D: The view at 3rd month after surgery.

Abnormal collagen cross-links, coupled with contraction force produced by myofibroblasts, leads to contracture development. In the residual phase, nodular appearance vanishes and tendon-like thick fibrous bands develop. The cords may shorten and become more prominent, and they may cause more flexion and contracture in the MCP and PIP joints (5-7).

Although former clinical studies have shown that triamcinolone and collagenase injections are effective for management when the disease is in the early, nodular form, the recurrence rates have been reported to be high. Therefore, the current gold standard treatment for Dupuytren disease is still surgical excision of fibrotic bands causing contractures and correction of contractures (2,3).

There are several surgical options including percutaneous fasciectomy, partial fasciectomy, total fasciectomy, segmentary fasciectomy. Percutaneous needle fasciectomy, as a procedure commonly performed under local anesthesia on an outpatient basis, may become a cost- and resource-effective option particularly for elderly patients or for those who are unwilling to undergo a more serious invasive treatment or who have medical comorbidities. However, Dupuytren's contracture has a very high recurrence rate with needle fasciotomy; among patients undergoing percutaneous fasciotomy who experienced the return of Dupuytren's contracture suffered a recurrence rate of 65% to 90% between 3 to 5 years. The complication rates are lower, but complications such as transient neuropraxia or injury to the 5th digit's digital nerve may occur (4,8,9).

Partial fasciectomy is the most commonly preferred technique owing to a lower recurrence rate (about 20-25%) compared to percutaneous fasciotomy. However, complications such as infection, hematoma formation, and injury to a digital nerve or vascular structures are more common (10). In this study, patients with early-stage Dupuytren's contracture were enrolled. All patients were operated on with partial fasciectomy. None of them needed re-operation. Högemaan et al. reported a recurrence rate of 10.8% and a complication rate of 13.8% following total fasciectomy (11). We considered that as our patients also had early-stage Dupuytren's contracture, not only the site of contracture, but also palmar fascia leading to the 3rd, 4th, and 5th fingers were included by the incision, which reduced the recurrence rate.

In cases with Dupuytren's contracture, palmar fascia may be injured owing to its anatomic proximity to nerves and vessels. As the volume of contracture increases, palmar fascia invades surrounding nerves, skin, and tissues to a greater degree and anatomically deeper structures. Yenidünya et al. (12), in a study of 18 patients with most having a contracture of less than 30 degrees; reported a low complication rate with only one patient having had partial necrosis on skin flap. In our study, no major or minor complication was seen except for suture opening in 3 patients. These findings indicate that the complication rate of early Dupuytren surgery is lower than that performed in patients with more severe contractures. Particularly in cases with bilateral hand involvement, operating the other hand early in the course may achieve a more functional outcome.

Conclusion

Dupuytren's contracture surgery performed at an early period can achieve high surgical success and low complication rates. Surgery performed when the adhesions to the skin and adjacent tissues and skin contracture are mild has been shown to reduce the re-operation rate.

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