



## Ulnar Digital Artery Perforator Flap- An Innovative Reconstructive Option for Palmar Defect Post Dupuytren's Contracture Fasciectomy

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### Abstract

Dupuytren's disease is a chronic, progressive fibrotic condition of palmar and digital fascia and adjacent soft tissues, the end result of which is known as Dupuytren's contracture. There is shortening of tissues along lines of mechanical tension leading to limitation of extension of the affected digit, the most commonly affected digits being ring and little fingers. Various open surgical procedures have been described for Dupuytren's contracture release including fasciotomy, limited fasciectomy and radical fasciectomy.

In this article, we describe a preliminary case report of a patient who presented with severe Dupuytren's contracture of right ring and little finger, in whom we performed an ulnar digital artery-based perforator flap for coverage of palmar defect post fasciotomy. There is very limited literature regarding use of this novel flap in Dupuytren's contracture. This flap is thin, replaces like tissue with like, easily accessible within the same surgical field and technically simple.

### Introduction

Dupuytren's disease is a chronic, progressive fibrotic condition of palmar and digital fascia and adjacent soft tissues, the end result of which is known as Dupuytren's contracture. There is shortening of tissues along lines of mechanical tension leading to limitation of extension of the affected digit, the most commonly affected digits being ring and little fingers. Various open surgical procedures have been described for Dupuytren's contracture release including fasciotomy, limited fasciectomy and radical fasciectomy. Post-fasciectomy, local tissue re-arrangement in the form of Z-plasties or Y- to V- flap closure can be done if primary closure is not possible. Other options include open palm technique of McCash wherein the wound is allowed to heal by secondary intention post fasciectomy and application of full thickness skin grafts [1]. But management of severe cases where tendons and neurovascular structures are exposed following fasciectomy poses a challenge and in such cases, it is ideal to cover the defect with a flap, in order to achieve a tension free closure.

In this article, we describe a preliminary case report of a patient who presented with severe Dupuytren's contracture of right ring and little finger, in whom we performed an ulnar digital artery-based perforator flap for coverage of palmar defect post fasciotomy. There is very limited literature regarding use of this novel flap in Dupuytren's contracture. This flap is thin, replaces like tissue with like, easily accessible within the same surgical field and technically simple.

### Case Presentation

A male patient in his 60's, farmer by occupation, presented with Dupuytren's disease in his dominant right hand. On examination, he had a flexion contracture of ring finger (90 degrees at MCP joint) and little finger (20 degrees at MCP joint) with subcutaneous cords in palmar area proximal to ring finger. Initially limited fasciectomy with modified Bruner incision was performed over ring finger. The diseased palmar fascia was excised until complete release of contracture was achieved. Following this a defect of size 4 cm × 2 cm was created at the palm. This defect was covered with an ulnar digital perforator-based flap. With the help of hand held doppler the perforator was identified. Planning in reverse was done and flap with skin paddle of size 6 cm × 2 cm was marked. Incision was made and sizeable perforator was identified. Flap was raised, islanded on the identified perforator and rotated 90 degrees clockwise and inserted into the defect. The donor site was closed primarily.

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Figure 1: Pre-operative picture.

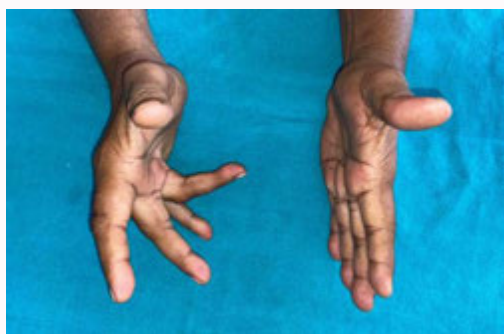


Figure 2: Pre-operative picture showing the flexion deformity.



Figure 3: Pre-operative picture showing flexion contracture.

On the first postoperative day, we observed mild discoloration of distal 1 cm margin of flap. Sutures were opened and hematoma underneath the flap was evacuated. One week postoperatively, there was an improvement in the discoloration. About 0.5 cm distal margin had full thickness loss, which was debrided and re-sutured (Figures 1-6).

## Discussion

Dupuytren's disease is an autosomal dominant, genetically inherited disease affecting the palmar fascia of the hands wherein the normal fascial structures-bands are replaced by pathological cords. Contraction of these cords leads to varying degrees of contractures of fingers and/or palm leading to significant disability to the patient. Traditionally in case of severe contractures, the defect was left open to heal by secondary intention as in the McCash open palm technique [2]. This technique requires prolonged splintage in extension, thereby delaying the rehabilitation and overall recovery time is longer [2]. Some authors advocated the use of free skin grafts. For application of



Figure 4: Operative picture.



Figure 5: Intra-operative picture after final inseting.



Figure 6: Follow-up at 3 months.

a skin graft, a perfect bed is required, which hampers the possibility of doing an adequate and radical resection of all diseased fascia. Moreover, the area becomes less resilient with possibility of future scar contracture [3].

Hence in severe cases flap coverage is the ideal reconstructive procedure of choice. While covering soft tissue defects of palmar area, considerations of sensation, color and texture match have to be kept in mind. This flap based on ulnar digital artery perforator is a single stage, versatile flap which can be used for various defects including post burn, post traumatic and Dupuytren's contracture defects of the palm and little finger [4].

The flap is outlined over ulnar aspect of hypothenar eminence, overlying the abductor digiti minimi muscle [4]. It is based on perforators arising from ulnar palmar digital artery of the little finger, which is found usually just distal to the palmar crease. Previous anatomical studies have shown that ulnar palmar digital artery of the little finger had at least one constant perforator between the level of MCP joint and 9 mm proximal to the MCP joint [1]. Hence the flap can be raised safely without compromising the vascularity of the little finger. A rim of fat is left intact around the perforator in order to minimize risk of postoperative congestion [4].

The main advantages of this flap are- it is durable, provides a good color and texture match as it is from the local area. The donor site is primarily closed thereby reducing morbidity to the patient and giving a good aesthetic outcome. It is a single stage procedure which is technically easy to perform. It allows for early initiation of physiotherapy thereby giving a good functional outcome in patients with Dupuytren's contracture. It can also be performed as a neurosensory flap with coaptation of the nerve distally [4]. The only disadvantage is the limited reach of the flap- can be used only up to ulnar aspect of distal palm and little finger and congestion in the early postoperative period as seen in most perforator-based flaps.

## Conclusion

The ulnar digital artery perforator flap can be considered as a valuable reconstructive option for coverage of skin defects over ulnar aspect of distal palm and little finger post fasciectomy in severe cases of Dupuytren's contracture as it provides excellent functional and aesthetic results with negligible donor site morbidity.

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