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Surgical treatment of Dupuytren's disease by aponeurectomy (15 cases)

Yassine Rachdi [1*], **Adnane Lachkar** [1], **Abdeljaouad Najib** [1], **Hicham Yacoubi** [1]

[1] Department of Orthopaedic Surgery, CHU Mohammed VI, Oujda, Morocco

*** Corresponding author:** Yassine Rachdi. Department of Orthopaedic Surgery, CHU Mohammed VI, Oujda, Morocco
Email: rachdiyassine91@gmail.com

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Abstract

Background: Dupuytren's disease is characterized by fibrosis of the superficial palmar aponeurosis, which can lead to a deformation of the fingers in flexion. The main objectives of the treatment of Dupuytren's disease are to reduce flexion and the associated disability.

Objectives: The objective of this study was to investigate the epidemiological and clinical profile of Dupuytren's disease and to analyze the results of treatment by aponeurectomy in comparison with the data in the literature.

Methods: We provided a 5-year retrospective study of fifteen cases of Dupuytren's disease treated by aponeurectomy at the Mohammed VI University Hospital in Oujda, Morocco, from February 2017 to March 2022.

Results: The mean age of the patients was 52.6 years, and 30% were women. For the risk factors, we found that 56% of the patients had a manual occupation, 30% were diabetic, 17% had a local trauma, 15% were known alcohol consumers, 25% were smokers, and 20% of the patients presented a similar case in the family. In terms of the clinical presentation, bilateral forms were found in 60% of cases, with a predominance of the 4th ray in both hands. Finally, 67% of our patients were diagnosed in the early stages of the disease (stages 1, 2, or 3 according to the Tubiana classification). Surgical treatment was proposed for 100% of the patients who underwent aponeurectomy, with very satisfactory results. Overall, our study allowed us to make findings that are similar to those described in the literature.

Conclusion: The genesis of Dupuytren's disease is not yet fully understood, despite numerous studies on collagen and fibroblasts. Surgery is the most common treatment. The appearance of collagenases, which proves to be very interesting for the treatment of palmar forms, still needs to be validated in the medium and long term for its efficacy and safety.

Keywords: Dupuytren, Tubiana, Aponeurectomy.

Introduction

Dupuytren's disease is characterized by fibrosis of the superficial palmar aponeurosis, which can lead to flexural deformity of the fingers. It is a common condition that affects adults, with the main risk factors being family history, age, male gender, diabetes, alcohol consumption, and tobacco use.[1-3]

Objectives

The goal of our work is to highlight the experience of the orthopedic trauma department B of the Mohammed VI University Hospital in Oujda. The study will focus on the epidemiological and clinical aspects, as well as the analysis of the results of the surgical treatment by aponeurosis of the pathology in question.

Methods

This retrospective study was conducted over 5 years (2017–2022), involving 15 patients operated on in the Traumatology-Orthopaedics B department of the CHU Mohammed VI Oujda, Morocco. We designed a complete exploitation form from the patients' medical records. We included all patients whose diagnosis of Dupuytren's disease was made and who had benefited from surgical treatment. We excluded patients with incomplete files or loss of sight. We opted for the Tubiana classification to classify the degree of disease evolution in our patients. The postoperative results obtained in the patients were evaluated using the Disabilities of the Arm, Shoulder, and Hand (QuickDash) score and compared with the literature.

Ethical considerations

The present study did not interfere with the process of diagnosis and treatment of patients. In this study, we explained the objectives and research process to the voluntary participants, obtained written informed consent from all individuals, and kept information confidential.

Statistical analysis

The categorical variables were presented as a percentage. All statistical analyses were performed using Google Forms.

Results

The mean age of the patients was 52.6 years, and 30% were women. Nine out of 15 patients were between 40 and 60 years of age, which corresponds to 60% of the study population. Five patients were between 60 and 80 years of age, corresponding to 30% of the population. One patient was under 40 years of age, corresponding to 6% of the population. The analysis of the data allows us to conclude that the risk factors found in the patients were, in decreasing order, manual activity, smoking, diabetes, local trauma, and finally alcohol consumption. For the distribution of the affected side, we note the predominance of bilateral involvement of both hands, which is consistent with the fact that most of the patients have jobs that require manual work using both hands. It can also be seen that the right hand is the second most affected hand, as the majority of patients are right-handed. Because the digital rays are affected unevenly, we concluded that the fourth ray (44.73% on the right and 52% on the left) is the most common location for both hands, followed by the fifth ray (26.31% on the right and 23.5% on the left), then the third ray (18.42% on the right and 14% on the left), then the second ray (10.52% on the right and 8% on the left), and finally the first ray (6% on the left hand). Most of the patients consulted in stages II and III were at a rather advanced stage of the disease [Figure 1].

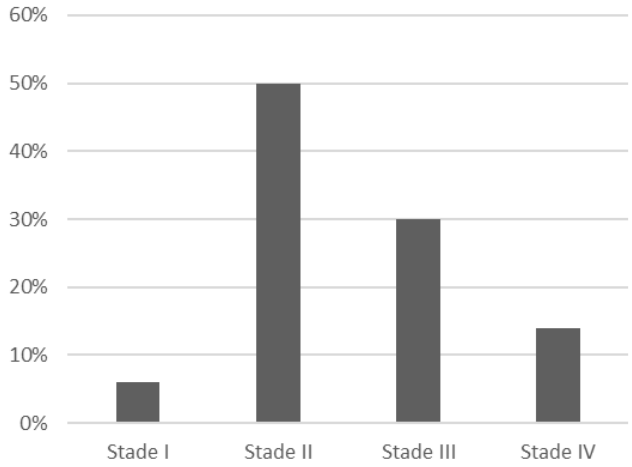

Figure-1. Distribution of cases according to stage

All patients underwent surgical treatment, with different approaches used: longitudinal palmar incision in 2 cases, ZIG-ZAG digitopalmar incision (BRÜNER incision) in 11 cases, and digitopalmar incision and Z-plasty in 2 cases. Subtotal aponeurectomy was performed in 10 patients, representing 66.66% of the population; total aponeurectomy in 3 cases, accounting for 20% of the population; and tenotomy in 2 cases, representing 13.33% of the cases. Our team chose MacCash as a suture method in 47.5% of cases, followed by skin sutures (32.5%), skin grafting (12.5%), and lengthening operations, which were performed in just 7.5% of cases. In terms of postoperative evaluation, we used the QuickDASH score to determine the gain acquired by aponeurectomy at 3 months, 6 months, and one year. This scoring system revealed a significant improvement in functional discomfort compared to preoperative discomfort. Only 21% of patients reported persistent functional discomfort. We had only one case of therapeutic failure. In Table 1, we report the mean scores for patients who underwent surgery for a single ray and then several rays.

Table-1. The mean scores for patients who had surgery for a single ray and then several rays

DASH score	Pre-operative	At 3 months	At 6 months	At 1 year
A single ray	19 (17-23)	13 (9-5)	8 (7-9)	7 (5-6)
Several departments	29 (22-35)	19 (13-25)	17 (12-22)	12 (8-16)

From this table, we can conclude that there is a very significant gain with aponeurectomy. We also note that the scores obtained on a single radius are lower than those reported on several operating radii. Concerning the complications, we have grouped them into three groups: intraoperative, immediate postoperative, and late complications. For intraoperative complications, nerve transection is the most important, as the collateral nerves are often involved in the pathological process. It is mainly at the digital level that dissection is difficult and lesions are to be feared. As for immediate postoperative complications, unfortunately, two cases presented with haematoma, one case of skin necrosis, one case of suture disunion, and one case of digital ischaemia. Late complications are of three types: sensory, functional, and trophic. Sensory disorders are the most common late-postoperative complication. In our series, they are of the order of 6%. These complications include hypoesthesia and dysesthesia in the operated fingers. On the other hand, we had only one case of trophic disorder and another case of functional disorder.

Clinical case

Mr. M.B., 57 years old, with risk factors of alcohol consumption and manual work, has had a digital retractility of the 5th ray for 5 years: stage III of Tubiana [Figure-2].

Discussion

In our series, the majority of cases of Dupuytren's disease occur in two-thirds of cases between 40 and 60 years of age and in one-third of cases after 60 years. We also found that Dupuytren's disease is rare before the age of 20. Our results were similar to those of Geoghegan et al., and MacFarlane et al.[4,5]

In almost all studies of Dupuytren's disease that have examined the epidemiological profile, there is a predominance of men. This predominance is clear in different populations: one woman for every 8 men in the series by Nguyen,[6] one woman for every 4 men in the series by Soulignac,[7] and in our series, there is a male-to-female ratio of 7 to 3. This male preponderance might be explained by males engaging in more manual tasks than women, which would be consistent with the significance of microtrauma in Dupuytren's disease.

Diabetes, smoking, and alcohol were frequently linked to the disease, and our percentage of patients with these factors is in line with the figures collected in the various literature studies, such as 20% of patients were diabetic in the series by Soufiane,[8] and 40% of cases were alcoholics and smokers; in our series, 19% were diabetic and 25% were alcoholics.

Concerning manual trauma, we found manual trauma in 10% of the population. Mikkelsen[9] found that manual work could have a certain influence on the development of Dupuytren's disease by showing a predominant involvement of the right hand, even in bilaterally affected subjects.

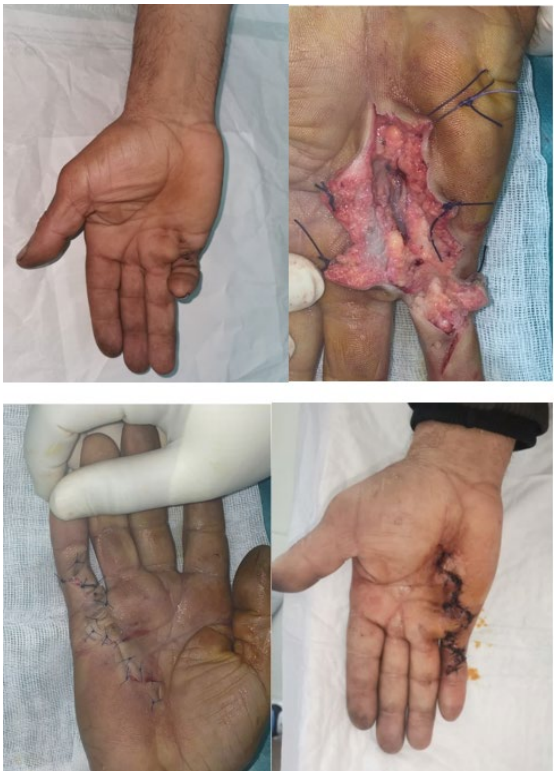

Figure-2. Clinical case of a patient who has had a digital retraction of the 5th ray for 5 years: stage III of tubiana

Clinical experience shows that Dupuytren's disease does not occur by chance in the families of affected individuals. However, this familial aggregation has been little studied systematically in epidemiology.[10] In a relatively large French study, the prevalence of Dupuytren's disease in men was 8% in the absence of a family history and 20% in the opposite case.[11] For the stage of contraction, in different studies, we have found that patients presented for

consultation at rather advanced stages of Dupuytren's disease, notably Tubiana stages II and III.

Historically, surgical therapy began with percutaneous aponeurotomy, which Sir Cooper and Baron Dupuytren recommended, and progressed to aponeurectomy. The frequency of recurrences led to a shift towards "radical" aponeurectomies before returning to limited aponeurectomies due to the numerous complications and modest reduction of recurrences. Only one treatment, skin excision followed by grafting, resulted in a net decrease in the recurrence rate.[12] Another significant step forward in reducing complication rates has been the use of the MacCash "open palm" technique. Although limited aponeurectomy, which simply excises the pathological tissue, is currently the most widely used surgical technique, the technique varies depending on the skin incisions. The wound can be sutured or left "palm open" as described by MacCash[13] using the Dupuytren method. It is possible to remove it and replace it with a graft.[14] These stepped transverse incisions, both digital and palmar, are made along the cord, allowing for partial removal of the cord. The wounds are left open and heal with the second intention, with a nocturnal extension device not hindering immediate daytime mobilization. The advantages are small scars, reduced pain, absence of hemorrhage, absence of post-operative skin necrosis, and early mobilization. The major disadvantage is the narrowness of the incisions, which do not allow the vascular-nerve pedicles to be seen, thus exposing them to the risk of intraoperative injury. The most frequent intraoperative complications are nerve lesions, with a percentage of 10% for our series. This complication is due to the difficulties encountered in the dissection of pathological fibrous tissue surrounding the vascular-nerve bundles. Arterial lesions are less frequent because they often go unnoticed as the patient is operated on under general anesthesia. Finally, skin perforations are found in 6% of cases in our series. This complication occurs in cases of nodular dissection, and Norotte et al.,[15] found it in 3.4% and 11.2% of cases, respectively. We can therefore conclude that our series is in line with the other series found in the literature.

Conclusions

Dupuytren's disease remains a mysterious disease to this day, with its origin and pathophysiological processes poorly defined. The disease exhibits great clinical variability between patients, likely due to geographical areas, making it difficult to translate results across populations. The surgical treatment outcomes in our orthopedic trauma department at the CHU Mohammed VI Oujda are highly satisfactory but dependent on the preoperative stage and extent of the disease.

Acknowledgment

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Competing interests

The authors declare no competing interests.

Abbreviations

QuickDASH: Disabilies of the Arm, Shoulder and Hand.

Authors' contributions

All authors read and approved the final manuscript. All authors take responsibility for the integrity of the data and the accuracy of the data analysis.

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None.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Ethics approval and consent to participate

All procedures performed in this study involving human participants were in accordance with the 2013 Helsinki Declaration. Informed consent was obtained from all participants.

Consent for publication

By submitting this document, the authors declare their consent for the final accepted version of the manuscript to be considered for publication.

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