



Original Article

Epidemiological analysis of patients with Dupuytren's disease[☆]



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ABSTRACT

Objective: To evaluate the risk factors and analyze the characteristics of patients and lesions in Dupuytren's disease.

Methods: Retrospective analysis of patients diagnosed with Dupuytren's disease in a hand surgery clinic in 2013. The authors evaluated parameters associated with the patient profiles and risk factors, the form and severity of involvement, and characteristics of the lesions.

Results: 58 patients were evaluated, totaling 79 hands, with bilateral involvement in 46% of cases. The involvement of the ulnar fingers of the hand represented 78%, 44% being the ring finger. In 55% of cases, the patients had cords, while 45% showed only nodules. As for related factors, they were found most commonly in men (55%), whites (93%), and the elderly. Of coexisting diseases, the following were present: diabetes mellitus (49%), especially in the insulin-dependent (62%), hypertension (55.2%), and dyslipidemia (19%). With regard to lifestyle, 22% were smokers and 9% were alcohol consumers.

Conclusion: It was observed a higher incidence of Dupuytren's disease was observed among men, whites, and the ulnar fingers of the hand, especially the ring finger. The most common associated diseases were diabetes mellitus and hypertension.

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Análise epidemiológica dos pacientes com doença de Dupuytren

RESUMO

Objetivo: Avaliar os fatores de risco e analisar as características dos pacientes e das lesões encontradas em portadores da doença de Dupuytren.

Métodos: Análise retrospectiva dos pacientes diagnosticados com a doença de Dupuytren no ambulatório de cirurgia da mão em 2013. Foram avaliados parâmetros associados ao perfil dos pacientes e fatores de risco, a forma e gravidade do acometimento e as características das lesões.

Palavras-chave:

Doença de

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[☆] Study conducted at Departamento de Ortopedia e Traumatologia, Hospital Naval Marcílio Dias, Rio de Janeiro, RJ, Brazil.

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Resultados: Foram avaliados 58 pacientes, 79 mãos, com acometimento bilateral em 46% dos casos. O envolvimento dos dedos do lado ulnar da mão representou 78%, 44% dos casos no dedo anular. Em 55% dos casos os pacientes apresentavam cordas, enquanto 45% mostravam apenas nódulos. Quanto aos fatores relacionados, encontramos predomínio em homens (55%), brancos (93%) e idosos. Das doenças coexistentes, estavam presentes a *diabetes mellitus* (49%), especialmente nos insulínodpendentes (62%), hipertensos (55,2%) e dislipidêmicos (19%). Com relação aos hábitos de vida, 22% eram fumantes e 9% etilistas.

Conclusão: Foi observada uma maior incidência da doença de Dupuytren entre homens, brancos, nos dedos do lado ulnar da mão, principalmente no dedo anular. As doenças mais comumente associadas foram o *diabetes mellitus* e hipertensão arterial sistêmica.

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Introduction

Dupuytren's disease is characterized by palmar fascia hypertrophy due to the appearance of a proliferative fibroplasia of the subcutaneous tissue, which may present itself as nodules or cords. The nodules represent sites of active contraction of the tissues, while the cords are made of normal fascia that bind the nodules to the skin and the surrounding tissues, resulting in contractures in a progressive and irreversible flexion of the finger joints.^{1,2}

According to Luck,³ this is a progressive disease with three phases. Histologically, the palmar fascia begins to present a significant increase in disorganized myofibroblasts, known as the proliferative stage. These cells agglomerate, forming a dense concentration aligned with the tension lines, known as the involutive stage, to finally be replaced by a firm collagen tissue with myofibroblasts disappearance and cord formation, characterized as the residual stage.⁴⁻⁷

The physiopathology of Dupuytren's disease is still unclear; several theories have been postulated, such as the microangiopathic alteration of vascularization, as well as a metabolic alteration, due to long-term endocrinological diseases and the use of medications that may alter the individual's metabolism.^{8,9}

In the world population, Dupuytren's disease is characterized by a higher prevalence of individuals of Caucasian or Nordic origin (white ethnicity), usually in the fifth to the seventh decades of life, and more frequently in men than in women. Furthermore, this disease has a higher incidence in individuals with metabolic disorders (diabetes mellitus and dyslipidemia, among others), and in users of antiretrovirals or anticonvulsants.^{10,11}

There is no clear causal relationship between the use of the aforementioned drugs and metabolic alterations with Dupuytren's disease. Some studies indicate that both the drugs and the diseases affect the local circulation of the palm, such as in microangiopathy, in addition to changes in the production of cytokines and growth factors, which leads to increased collagen production and damage to adipose tissue, causing a fibrotic response. However, none of these mechanisms has been clearly determined.^{5,6,12}

Evidence also points to heredity as a predisposing factor in this pathology, suggesting an autosomal dominant pattern. Probable causes also include vascular insufficiency, cigarette

smoking, occupational activity, and trauma to the hand. There are also conflicting reports about the disease in alcoholics.^{6,7}

Regarding the pattern of involvement, the most frequent fingers are the ring and the little fingers; the disease is more severe and common in the dominant hand. There is no causal relationship for this form of manifestation.^{2,8}

Approximately 5% of patients with Dupuytren's disease have similar lesions of the plantar fascia, known as Ledderhose's disease, and 3% present plastic alterations of the penis, known as Peyronie's disease. Patients with these associated findings are considered to have a Dupuytren's diathesis and are prone to a more aggressive course of the disease, which is progressive and recurrent.^{9,10,12}

Despite the high prevalence of this pathology in hand surgery outpatient clinics, there is still no consensus on its causes, and epidemiological studies are still scarce in Brazil. The present study is aimed at evaluating risk factors and to assess the characteristics of patients and the lesions found in patients diagnosed with Dupuytren's disease in a hand surgery outpatient clinic.

Material and methods

This study retrospectively evaluated all of the 58 patients with Dupuytren's disease treated at this hand surgery outpatient clinic in 2013. All subjects agreed to participate after being informed of the study's objectives. This study was submitted to and approved by the hospital's ethics committee.

The diagnosis was made through a detailed clinical examination by the same physician, a specialist in hand surgery; data acquisition took place through guided case history and physical examination, in addition to a questionnaire, prepared by the authors, which evaluated the form and the severity of the disease, as well as the patient's lifestyle and associated diseases ([Appendix](#)).

Results

The study included 58 patients, 26 (44.8%) women and 32 (55.2%) men (ratio 1:1.2). Of these, 54 (93.1%) were white or mixed-race, and four (6.9%) were black; 20 presented the disease in the right hand, 17 in the left, and 21 in both (79 hands).

In order to facilitate the analysis, patients were grouped by age: those under the age of 50 years comprised group A (six patients); those between 51 and 60 years, group B (13 patients); those between 61 and 70 years, group C (24 patients); and those over 70 years, group D (15 patients). This high prevalence in elderly patients, especially group C, is in agreement with the literature and is due, among other factors, to the late development of hypertrophy and the absence of symptoms such as pain, itching, or functional limitation until the residual phase, when the cords promote finger flexion.

The gender distribution was as follows: group A consisted of men only; group B, three men and ten women; group C, 13 men and 11 women; and group D, ten men and five women.

Regarding the conditions mentioned in the literature as predisposing factors, of all the patients, 32 reported having systemic arterial hypertension (55.2%); 26 were diabetics (49%), of which 62% were insulin-dependent; 11 were dyslipidemic (19%); two were HIV-positive (4%); and three were epileptics (5%) and used anticonvulsants.

Considering the other classic risk factors, 13 patients were smokers (22%), five were alcoholics (9%), two referred a previous history of trauma in the affected hand, and five (9%) reported having first-degree relatives with the same disease. Furthermore, two patients had involvement of the feet (Ledderhose's disease). However, no patients reported having contractures of the penis (Peyronie's disease).

Finally, through physical examination, it was observed that 26 patients had nodule-like lesions and 32 had cords in addition to the nodules. The most affected fingers were the ring (33 hands), little (26), middle (10) fingers, and the thumb (six).

Discussion

Dupuytren's disease is a fibroproliferative alteration of unknown cause that affects the palmar fascia, replacing it with firm collagenous tissue, which leads to the formation of nodules and cords with finger retraction in flexion.¹ The lesion activity and the resulting degree of deformity are variable; in some patients, the lesion progresses constantly, while in others there are exacerbations and remissions. Nonetheless, regression is rare.^{2,4,12}

The etiology of Dupuytren's disease is still unknown. There is evidence of a hereditary tendency that suggests an autosomal dominant pattern, with variable and reduced prevalence in women.^{6,11,13} Multiple factors, including age, gender, and ethnicity, play an important role in the prevalence of the disease. The prevalence of this disease in white males, especially in northern European countries, is evidenced by the predominant age group between the fifth and seventh decades of life, with a male to female incidence ratio of 7:1-15:1.^{1,2,6,14,15} In the present study, 93% of the patients were white/mixed-race in the age group of 41-78 years; the seventh decade was predominant, with a mean age of 63.8 years. Regarding gender, the male to female ratio was 1.23:1, which diverges partially from the data found in the literature. The authors believe that this proportion is due to the small number of cases, which did

not allow a statistical study. Moreover, 9% of cases had a family history of the disease in first-degree relatives.

Regarding laterality, bilateral involvement was observed in 36% of the cases; involvement of only the right side was observed in 34%, and of only the left side, in 30%. There was predominance of involvement of fingers on the ulnar side of the hand in 78% of the cases; 44% in the ring finger, 34% in the little finger, 14% in the middle finger, and 8% in the thumb; no cases of index finger involvement were observed. All these data corroborate those observed in the literature.^{4,6,10,11,15} Regarding the degree of involvement, 55% of the patients presented cords, while 45% showed only the nodular stage. Concomitant involvement and contracture of the plantar fascia (Ledderhose's disease) was identified in two patients, whereas penile fascia (Peyronie's disease) was not observed in the present patients.

There are reports in the literature of several associations of underlying diseases, lifestyle characteristics, or trauma with Dupuytren's disease. Among the most commonly cited are diabetes mellitus, dyslipidemia, smoking, alcohol use, epilepsy, HIV infection, and trauma.¹⁶⁻¹⁸

Although no studies associating Dupuytren's disease and systemic arterial hypertension were retrieved in the literature, the high prevalence of patients with both diseases in this study (45%) indicate a possible relationship between these two conditions, suggesting the need for new studies to better understand this association.

Several studies have associated Dupuytren's disease with diabetes mellitus.^{4,15-18} In 2004, Geohegan et al.¹⁷ performed a large case-control study in a population with this disease. In that study, diabetes mellitus was identified as a significant risk factor, mainly in insulin-dependent diabetes. This may be due to the high severity of this form of the disease or because, typically, it affects younger patients, who are subjected to a longer illness. In the present study, the prevalence of diabetes was 45%, of which 62% was insulin-dependent.

Regarding smoking, Dupuytren's disease has been reported three times as often in smokers, possibly because it is related to microvascular changes that generate hypoxic conditions in the tissues.^{6,16,19} One study showed that 68.2% of patients with Dupuytren's disease were smokers.²⁰ In the present study, 22% of the patients were smokers or former smokers.

The mechanism that links Dupuytren's disease with alcohol is unclear. It is believed that the increase in free radicals due to alcohol metabolism is involved in the genesis of the disease. Furthermore, it has been suggested that alcohol may cause damage to adipose tissues by provoking a fibrotic response or altering prostaglandin production; however, none of these theories has been proven. It is noteworthy that despite the observed association between alcohol and Dupuytren's disease, most patients in the present study were not alcoholics. Five patients (9%) declared to consume alcoholic beverages.^{15-17,21}

Many studies have associated Dupuytren's disease with epilepsy or the use of anticonvulsants. A causal relationship has not been established. The literature presents reports of incidence of the disease in this group ranging from 8% to 57%. In the present study, 5% of the patients reported epilepsy and regular use of anticonvulsants.^{5,13,22}

An increased prevalence of Dupuytren's disease has been reported in HIV patients. The study by Bower²³ indicated that 36% of patients with HIV presented the disease. Possibly, this relationship is due to the increase in the production of free radicals caused by the infection. Therefore, the prevalence of Dupuytren's disease in HIV-infected patients may be an important marker of disturbance in free radical metabolism, which in turn may be a significant intermediary mechanism in the development of AIDS. This suggests that treatment with free radical reducing drugs may play a role in preventing some manifestations or progression of the disease. In the present study, a prevalence of 4% of HIV-infected patients with Dupuytren's disease was observed, in line with other reports in the literature.²⁴

Another causal relationship with Dupuytren's disease is heavy work or trauma. The study of this association has become important at a time when an increase in work-related illnesses is being observed. Studies indicate that Dupuytren's disease may be associated with vibration or trauma to the hand, but not associated to repetitive tasks.^{25,26} In this study, 4% of the patients reported a history of previous trauma in the hand affected by the disease.

Regarding dyslipidemia, some results suggest its influence on the pathogenesis of Dupuytren's disease; electron microscopy studies revealed lipid inclusions within fibroblasts and the extracellular connective tissue of pathological palmar aponeurosis.²⁷ In the present study, the prevalence of this pathology was 19%.

Conclusion

The etiology of Dupuytren's disease continues to be undetermined. In the present study, which is in agreement with the literature, a high prevalence of risk factors was observed, such as advanced age (mean 63.8 years); diabetes mellitus (49%), mainly in insulin-dependent patients (62%); and white ethnicity (93%). Moreover, a higher involvement of the fingers on the ulnar side of the hand was observed; the ring finger (44%) was the most prevalent, followed by the little finger. However, unlike previous studies, a high prevalence of hypertensive patients (49%) and a much lower proportion of affected men and women (1.23:1) were observed.

Conflicts of interest

The authors declare no conflicts of interest.

Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.rboe.2017.12.003.

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