

Graves' orbitopathy surgical intervention due to esotropia and diplopia: a case report

Intervenção cirúrgica na esotropia e diplopia secundárias à orbitopatia de graves: um relato de caso

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KEYWORDS:

Graves' orbitopathy; Esotropia; Strabismus; Diplopia; Ocular surgery.

ABSTRACT

Graves' orbitopathy is an organ-specific autoimmune reaction in which antibodies react against orbital cells, resulting in inflammation of various structures, including the extraocular muscles. Diplopia and strabismus are the limiting consequences of this condition. This study included a case of a 55-year-old female patient with restrictive strabismus and diplopia after orbital decompression due to Graves' orbitopathy. The symptoms were affecting her daily activities. The clinical outcomes were extremely satisfactory. Furthermore, a potential improvement in the patient's quality of life can be achieved by considering the chronology of interventions and using adequate surgical techniques.

PALAVRAS-CHAVE:

Orbitopatia de Graves; Esotropia; Estrabismo; Diplopia; Cirurgia ocular.

RESUMO

A orbitopatia de Graves decorre de uma reação autoimune órgão-específica, na qual anticorpos reagem contra células orbitais, resultando inflamação de várias estruturas, incluindo os músculos extraoculares. Diplopia e estrabismo são consequências limitantes desse processo. O presente artigo relata o caso de uma paciente feminina de 55 anos com estrabismo restritivo e diplopia, afetando seu dia a dia, após descompressão orbitária por Orbitopatia de Graves, cujo desfecho clínico-cirúrgico foi extremamente satisfatório. O respeito à cronologia das intervenções e adequada técnica cirúrgica oferecem potencial melhora na qualidade de vida do paciente através de ganho funcional e estético, reforçado pelo presente relato.

INTRODUCTION

Graves' disease is an autoimmune disease characterized by the production of autoantibodies against the thyroid-stimulating hormone receptor (TSH-R) resulting in thyroid dysfunction. Most patients with Graves' orbitopathy (GO) usually present with an endocrinological condition called hyperthyroidism in addition to periorbital condition. Hyperthyroidism

is an excess of hormones produced by the gland. However, GO may also be present in euthyroid or hypothyroid patients¹. This association suggests the presence of a common antigen between the thyroid gland and orbital tissues.

The presence of TSH receptors in orbital fibroblasts justifies the clinical presentation¹. Upper eyelid retraction is the most common sign of the disease,

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which occurs in up to 90% of all patients resulting from hyperactivity of the Mullerian muscle. This muscle has sympathetic innervation and is responsible for eye opening. Proptosis occurs in up to 60% of all cases. GO is the main cause of bilateral and unilateral proptosis in this population. Rarely, an increase in adipose and muscular tissue in the orbit can result in the compression of the optic nerve and optic neuropathy^{1,2}.

GO often involves the extraocular muscles in the form of restrictive strabismus due to muscle enlargement secondary to fat infiltration between the muscle fibers. The most affected muscles are as follows (in descending order): (1) inferior rectus, (2) medial rectus, (3) superior rectus, and (4) lateral rectus^{1,2}. Strabismus may cause anomalous head positions and diplopia in 26%-45% of patients. Moreover, these symptoms may significantly impair the performance of daily activities³⁻⁵. As is emphasized by the literature and this report, the consideration of the chronology of interventions and the use of adequate surgical techniques can potentially improve the patient's quality of life through functional and esthetic gains.

CASE REPORT

This study included a female patient aged 55 years old who is a smoker in abstinence for 6 months and was diagnosed with GO 7 years ago. The pa-

tient presented with strabismus and diplopia after orbital decompression was performed (Figure 1). During the preliminary examination, she presented with esotropia (ET) of 35–40 prismatic diopters in the left eye, as measured using the Krimsky method. She also reported diplopia in the primary position of gaze (PPG) (i.e., levo- and supraversions). These findings were supported by muscle restriction and are consistent with the literature as the medial and inferior rectus muscles are most frequently involved. During surgery, a bilateral 6-mm recoil of the medial rectus muscles was performed. At 1 month after surgery, during follow-up evaluation, the patient expressed significant esthetic and functional satisfaction. Diplopia was not observed during examination based on the PPG. She had a small residual deviation of ET OE of 8 SD and hypotropia of 4 SD in the prismatic cover test (Figure 2).

DISCUSSION

Despite the surgical challenges represented by strabismus in GO, the patient was satisfied with the esthetic results and resolution of diplopia in the PPG and the most cardinal positions of gaze. The surgery could rehabilitate the patient to return to her daily activities³⁻⁵. It is important to recognize the existence of two phases in GO. The first phase is denominated the "dynamic phase", followed by the "static phase".



Figure 1. Preoperative photodocumentation of the nine gaze positions.

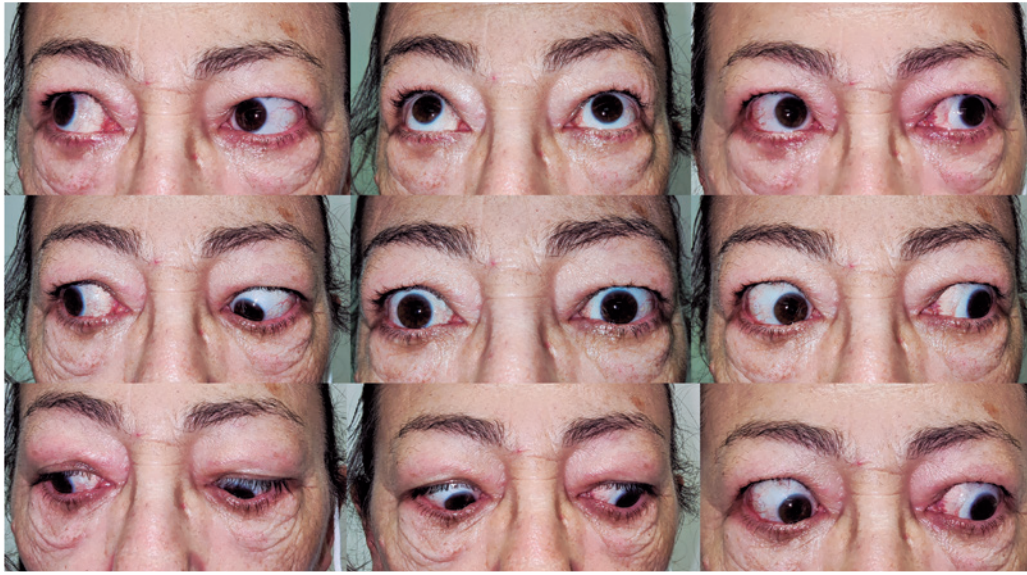


Figure 2. Postoperative photodocumentation of the nine gaze positions four weeks after surgery.

The dynamic phase focuses on regulating inflammation and stabilizing the condition. In mild cases, nonsteroidal anti-inflammatory drugs are initiated. The therapeutic arsenal in moderate to severe cases comprised oral corticosteroids, pulse therapy, and radiotherapy. Recent studies investigated new monoclonal antibodies in the dynamic phase. In the static phase, it is possible to correct proptosis, strabismus, and upper eyelid restriction^{1,2}. Achieving the desired therapeutic outcome requires the consideration of the correct sequence of procedures. Strabismus correction should only be performed after orbital decompression as indicated. If the patient wishes, correction of upper eyelid retraction can be performed after strabismus surgery. In this final stage, it is possible to choose between surgical treatment and botulinum toxin. Stability of the underlying clinical disease and abstaining from preoperative smoking are also essential for success. Tobacco is associated with GO decompensation and is directly linked to a worse prognosis and higher incidence of strabismus. Furthermore, smoking increases the risk of developing GO by up to seven times in addition to being related to more severe presentations of the disease^{1,2,6,7}.

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