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NÚMERO DE ESTUDANTE | DATA DE CONCLUSÃO

06080042 |

DESIGNAÇÃO DA ÁREA DO PROJECTO

Oftalmologia

TÍTULO DISSERTAÇÃO/MONOGRAFIA (riscar o que não interessa)

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COORIENTADOR (se aplicável)

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Assinatura conforme cartão de identificação: João Aragão Rodrigues

À minha mãe, ao meu pai e à minha irmã.

ECTROPION

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Précis

Ectropion is an abnormal eversion of the eyelid margin. The understanding of the underlying pathophysiological mechanism is the key to a successful surgical treatment.

ABSTRACT

Purpose: Ectropion is one of the most common eyelid malpositions. The treatment of ectropion is still a subject of controversy. The authors reviewed the literature about ectropion, including definition, diagnosis, pathophysiological mechanisms, classification and surgical treatments.

Methods: A literature search was performed on the MEDLINE database using the keywords ectropion, eyelid malposition, cicatricial ectropion, congenital ectropion, involucional ectropion, mechanical ectropion, tarsal strip; lazy-T; canthoplasty, canthopexy, skin flaps, skin grafts. Only articles in english were included.

Results: There is no consensus about the best surgical treatment for this eyelid malposition, however, we know that the identification of the anatomic abnormality associated is the most important point to chose the correct surgical treatment. The literature on the treatment of ectropion mainly includes descriptions of surgical techniques without objective measurements of the results, and uncontrolled studies.

Conclusions: The scientific literature on ectropion is vast, however there is a need for quantitative studies on the effects of ectropion correction using different surgical techniques.

Ectropion is an eversion (outward turning) of the eyelid margin. This lid malposition may affect the lower or upper lid and leads to cosmetic and functional deficits, such as conjunctival hyperemia, corneal exposure, eye irritation, epiphora, chronic conjunctivitis, and in rare cases visual loss. It can be medial or lacrimal, lateral or complete (involving the entire eyelid).[1,2]

METHODS OF LITERATURE SEARCH

A literature search was performed on the MEDLINE database using the keywords ectropion, eyelid malposition, cicatricial ectropion, congenital ectropion, involucional ectropion, mechanical ectropion, tarsal strip; lazy-T; canthoplasty, canthopexy, skin flaps, skin grafts. Only articles in english were included.

The research adhered to the tenets of the Declaration of Helsinki and was approved by the Ethics Committee of the Hospital de Braga, Braga, Portugal. An informed consent was obtained from patients whose photos were used in this article.

CLASSIFICATION OF ECTROPION

Ectropion is usually classified as congenital, involutional, cicatricial, mechanical and paralytic.[1,2] These categories are not absolute and some cases fit in more than one type. For instance, a four-lid ectropion in a newborn with lamellar ichthyosis can be considered as a congenital or a cicatricial ectropion. Similarly, the ectropion of a child born with an orbital cyst, which mechanically pushes the lid margin, may be seen as a congenital mechanical ectropion, and congenital facial palsies may cause a congenital paralytic ectropion.

From a therapeutic perspective, rather than focusing on the clinical categories it is more useful to look at the underlying pathophysiological mechanism (Table 1) because the correct identification of the anatomic abnormality associated with the lid margin malposition is the key to a successful surgical procedure.

CONGENITAL ECTROPION

The designation “congenital ectropion” is used to name a variety of conditions with distinct pathophysiological mechanisms. A typical example is the so-called congenital upper eyelid eversion. This rare lid abnormality, usually present at birth, is characterized by eversion of both upper lid margins with prolapsed chemotic conjunctiva. It is typically symmetrical but some degree of asymmetry is not uncommon. Several factors have been implicated in its pathophysiology including trauma at birth, orbicularis hypotonia, posterior lamella vertical elongation and failure of the orbital septum to fuse with the levator aponeurosis with adipose tissue interposition. Most cases are not associated with ocular or general abnormalities. However, the incidence appears to be higher in Down syndrome. This peculiar form of upper lid ectropion responds well to conservative treatment such as topical ointments and lubricants, patching or temporary tarsorrhaphy.[3-6]

A totally different situation is represented by newborns with severe forms of lamellar ichthyosis. In these patients eyelid eversion is due to severe skin contraction. All four lids may undergo a severe form of cicatricial ectropion that might require early skin grafting in order to prevent corneal ulceration and eye perforation. Shortening of the anterior lamella is also implicated in other syndromes associated with congenital ectropion such as blepharophimosis (lower lid laterally)[7],

blepharocheilodontic syndrome (lower eyelids)[8-10] and Down syndrome (upper and lower lids)[11], as well a variety of sporadic congenital anomalies including craniofacial clefting.[12]

INVOLUTIONAL ECTROPION

Involutional ectropion is the most frequent form of lower eyelid eversion, commonly found in aged patients. The Blue Mountain Eye Study assessed the prevalence and associations of ectropion in a large cohort of residents of Sydney, Australia (3654 people aged 49-97 years). Ectropion prevalence was higher in men (5.1%) than women (3.0%). The prevalence of lower eyelid ectropion increased with age, reaching 16.7% among patients above 80 years old.[13] Damasceno studied a Brazilian population of 24 565 elderly people and found similar results, with a prevalence of 17.7% in subjects aged 80 years or more.[14]

Several factors have been implicated in the pathogenesis of this eyelid deformity, all related to an abnormal laxity of the lid support system including tarsal and orbital septum atrophy, thinning of the skin and subcutaneous tissues, elongation of the tarsus and pretarsal orbicularis, medial and lateral canthal tendon laxity and dehiscence, and elongation or desinsertion of the lower lid retractors.[2] Heimmel suggested that when these predisposing factors are present, the key to final lower eyelid position is the globe axial projection, with relatively exophthalmic eyes being more likely to develop tarsal ectropion.[15]

Histopathological studies have confirmed the role of age-related changes in the tarsal plate, inferior retractors, orbicularis oculi and lateral canthal tendon in the

lids with involutional ectropion.[16,17] The affected lid shows the presence of collagen degeneration and elastosis of the tarsal plate and canthal tendons, an increased amount of adipose tissue in the distal tarsus, and focal degeneration, fibrosis, and elastosis of the pretarsal orbicularis.[18-20] In chronic sun exposure, actinic damage on the anterior lamella contributes as an additional factor to lower eyelid eversion in patients with involutional ectropion.[21]

The evaluation of a patient with involutional ectropion should start with the inspection of the lid margin and the position of the puncta since one the first manifestations of lower eyelid ectropion is epiphora secondary to lacrimal punctum eversion. The patency of the puncta and lacrimal drainage system should always be examined.

The lower eyelid laxity can be detected using the “pinch test” and the “snap back test”. The result is abnormal if the lid can be distended more than 6 mm from the globe or does not briskly return to its natural position. The lateral canthus should form an acute angle and a rounded shape is indicative of lateral tendon elongation. If during traction of the lower lid there is lateral displacement of the lacrimal punctum towards the limbus, there is medial tendon laxity.[2, 22]

The condition of the lower lid skin is assessed by pulling the lower lid margin upwards. With traction the lid margin should reach a point at least 2 mm above the limbus. A relatively immobile margin indicates vertical shortening of the anterior lamella. This cicatricial component of the involutional ectropion is a common finding when the ectropion is present for a long period of time or can be the result of mild actinic changes of the skin. [2, 22]

CICATRICIAL ECTROPION

Cicatricial ectropion is caused by anterior lamella shortening. Depending on the etiologic mechanism, cicatricial entropion can affect the upper lids, the lower lids or both (as observed in same cases of ichthyosis). It usuallyinvolves secondary eyelid scars resulting from trauma[23, 24], burns[25-27] or from a large contingent of skin diseases such as ichthyoses[28, 29], discoid lupus erythematosus[30], inherited epidermolysis bullosa[31], generalized eruptive keratoacanthoma[32-34], cutaneous leishmaniasis[35], pityriasis rubra pilaris[36], and pyoderma gangrenosum[37, 38].

Postoperative complications of eyelid tumors[39, 40], blepharoplasty[41-44] and skin resurfacing[45, 46] are also common causes of lower lid cicatricial ectropion. Other sources of skin damage resulting in ectropion are radiotherapy[47, 48] and the use of drugs such as docetaxel[49], fluorouracil[50-52], anthrax[53], prostaglandins[54, 55], brimonidine[55], betaxolol[55], dorzolamide[55], timolol[55], and iopidine[56].

PARALYTIC ECTROPION

Paralytic ectropion is caused by the lack of normal innervation of the orbicularis muscle. Failure of normal lid closure with lower lid laxity and ectropion, upper eyelid retraction and brow ptosis are the clinical signs. The causes of seventh nerve palsy are myriad, but can be broadly divided, in the order of frequency, into idiopathic (Bell's palsy), traumatic (birth canal trauma or forceps delivery, surgical trauma, facial and temporal bone fractures), infectious (herpes zoster, Lyme disease, HIV infection, polio, mumps, cytomegalovirus, mononucleosis, leprosy, cat scratch fever), and neoplastic (acoustic neuroma, cerebellopontine angle tumors).[57]

In paralytic ectropion due to surgical trauma, the timing for facial reanimation surgery is under debate. Watts *et al* advocate that rehabilitation surgery with gold weight implantation and lateral tarsal strip should be performed immediately, at the time of facial nerve sacrifice.[58]

MECHANICAL ECTROPION

Mechanical ectropion is caused by eyelid tumors that evert the lower lid or inflammatory disorders that cause orbicularis spasm. Large tumors or cysts near the lid margin, acute proptosis with chemosis, eyelid and periocular edema, significant herniated orbital fat and traction on the lower eyelid skin from spectacles can mechanically cause ectropion. The treatment is directed at the cause.[2, 59-62]

TREATMENT

Lower or upper eyelid ectropions are usually managed with surgery. As mentioned before, the key for a successful surgical procedure is the correct preoperative identification of the underlying etiologic factor. Depending on the mechanism provoking the lid margin rotation, a variety of procedures are used to stabilize the lid margin. For instance, lower eyelid horizontal laxity with normal canthal tendon tonus can be addressed by pentagonal full thickness eyelid resection. If the lateral canthal tendon is abnormally lax tarsal strip procedures are indicated.[1, 2, 63, 64] This useful procedure is a variant of the old Bick's lateral resection[65] and consists of a lateral canthotomy and cantholysis; excision of skin and conjunctiva, leaving a free strip of tarsus; fixation of the tarsal strip to the periosteum of the lateral

orbital wall; and reconstruction of the lateral canthus to create the appropriate height and tension of the lower eyelid.[63, 66] Usually monofilament non-absorbable sutures are used [2, 64, 67, 68], but long-acting absorbable sutures will also work without recurrence of horizontal laxity. [66, 69, 70]

The repair of medial tendon laxity is more complicated than that of its lateral counterpart because of the intimate relation of the tendon with the canaliculi. The high rate of postoperative lacrimal problems following surgery on the medial canthus leads some surgeons to delay correction of the medial canthal tendon until laxity is advanced. Medial canthal tendon correction has been attempted by resection or plication of the tendon medial to the lower punctum, anchoring the tissue to either the anterior periosteum or posterior lacrimal crest.[71-75]

Lacrimal ectropion without horizontal laxity is classically treated with an excision of a diamond of conjunctiva and retractors below the punctum. If a horizontal laxity is present, a full-thickness wedge excision horizontally tight of the lid margin can be associated with the pentagon excision creating a lazy-T procedure. The wedge excision can be displaced laterally or be replaced by a tarsal strip. [76, 77]

In both procedures the role of lower lid retractor plication has been emphasized. Advanced tarsal ectropions require a large excision of conjunctiva and retractors by a posterior approach combined with everting sutures and horizontal tightening.[78-80]

Since cicatricial ectropion is due to an anterior lamella deficiency, various surgical techniques can be used to lengthen the underlying deformity. Z-plasties can be used to manage linear scars. [1, 2, 81] Large shortages of skin require local flaps [26, 82-85] or skin grafts [27, 48, 86]. There are a large variety of flaps that can be used to

correct lower and upper ectropions depending on the location and extension of the cicatricial process. Free skin grafts may be obtained from the upper lid, retroauricular region, supraclavicular area or inner aspect of the upper arm.[1, 2, 81]

In severe lower eyelid ectropion, there is often inadequate muscular support for the pretarsal lower eyelid. When the pretarsal orbicularis muscle is damaged, a fascia lata sling is an option for supporting the lower lid.[84]

CONCLUSION

A successful functional and cosmetic correction of ectropion depends on the understanding that ectropion is a group of eyelid malpositions that may have different etiological factors and may affect lateral, central or medial portion of the lids, alone or in combination. Surgery techniques must address the anatomic abnormalities responsible for the ectropion. The choice of the right procedure leads to a successful outcome for the patient which is the main goal.

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Table 1. Type of ectropion, affected lids and pathophysiologic mechanism.

Type of Ectropion	Affected Lid (s)	Pathophysiologic Mechanism
Congenital	UL, LL	Tarsus anomaly (absence or atrophy) Severe eyelid edema after birth trauma Eyelid skin retraction (cicatricial) Microphthalmus with orbital cyst (mechanical)
Involutional	LL	Horizontal lid laxity Lateral and/or medial canthal tendon laxity Tarsal and orbital septum atrophy Thinning of skin and subcutaneous tissues Senile enophthalmia Dehiscence, elongation or desinsertion of the lower lid retractors
Cicatricial	UL, LL	Shortening of the anterior lamella of the lid
Paralytic	LL	Orbicularis muscle atony
Mechanical	LL	Lesions or inflammatory disorders which cause the lid margin to roll out

UL, upper lid. LL, lower lid.

Figure 1. Lamellar ichthyosis. Congenital cicatricial ectropion of the lower eyelids.

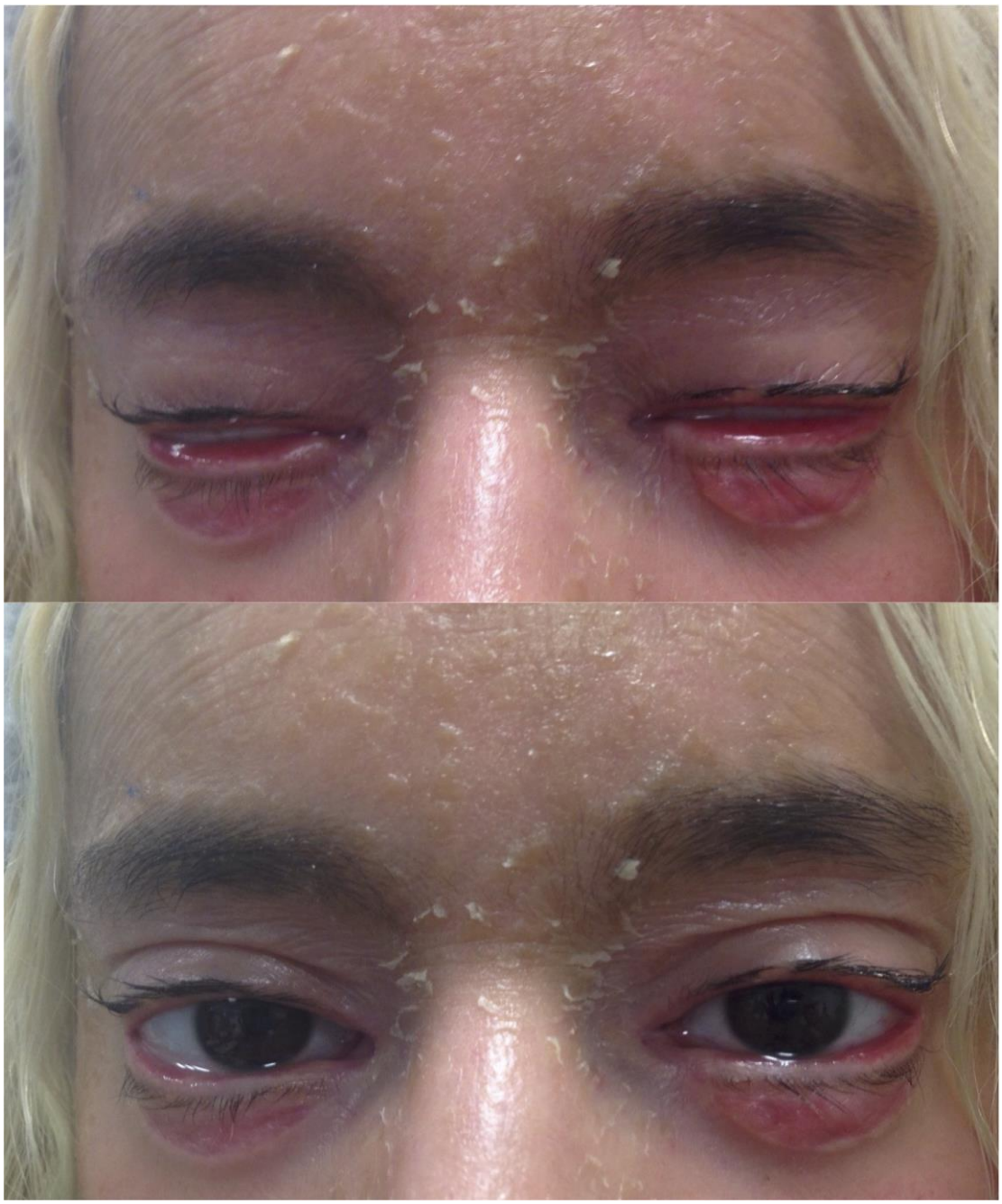


Figure 2. Involutional ectropion: A) total; B) medial; C) lateral.

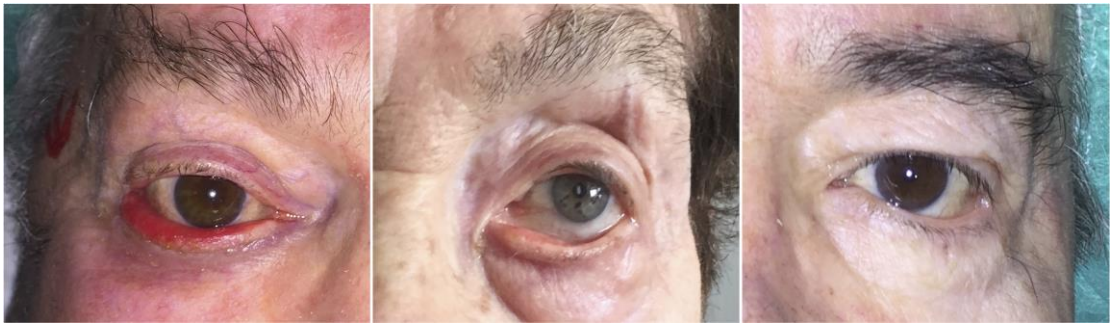


Figure 2. Cicatricial ectropion caused by an excision of basal cell carcinoma of the lower eyelid.

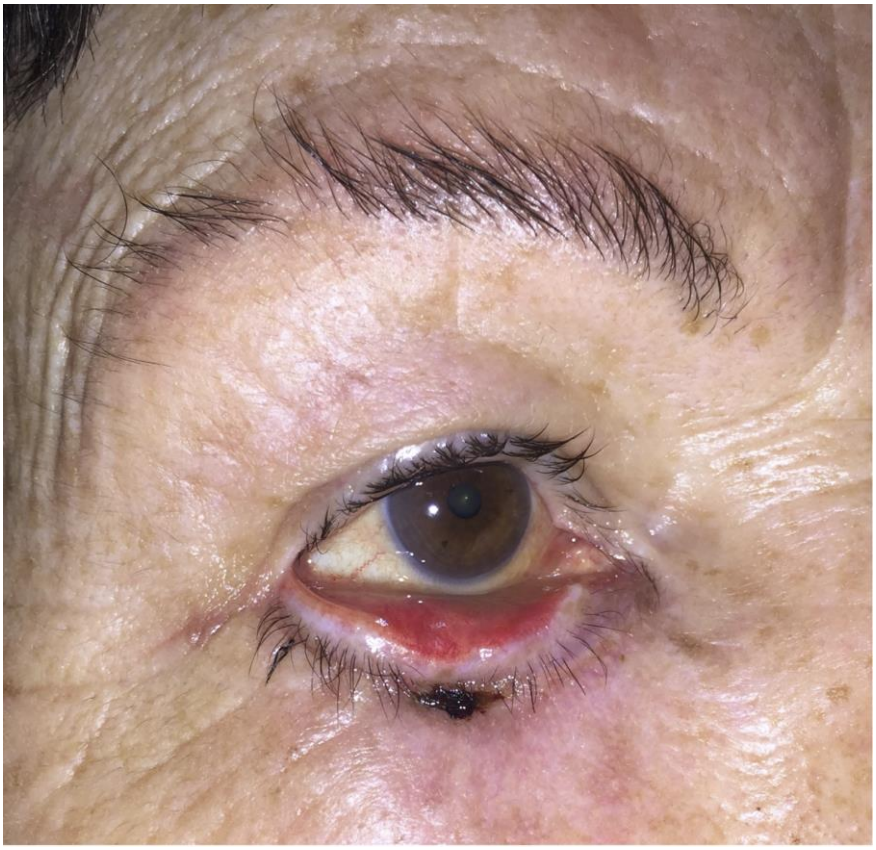


Figure 4. Left lower lid paralytic ectropion. Note lower lid laxity and ectropion, brow ptosis and absence of forehead wrinkles.

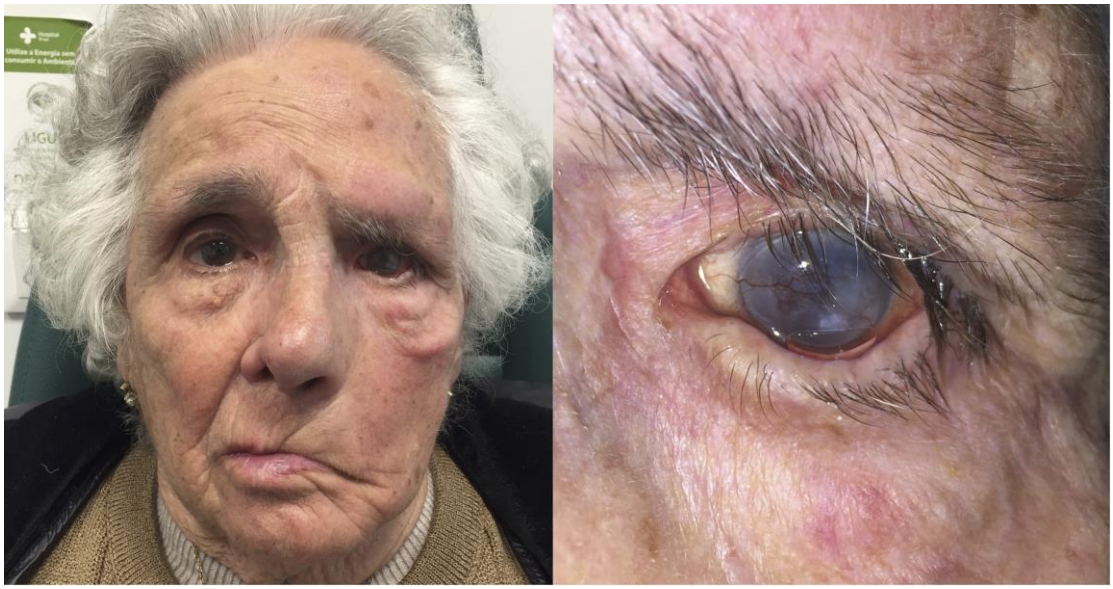


Figure 5. Mechanical ectropion caused by a basal cell carcinoma.

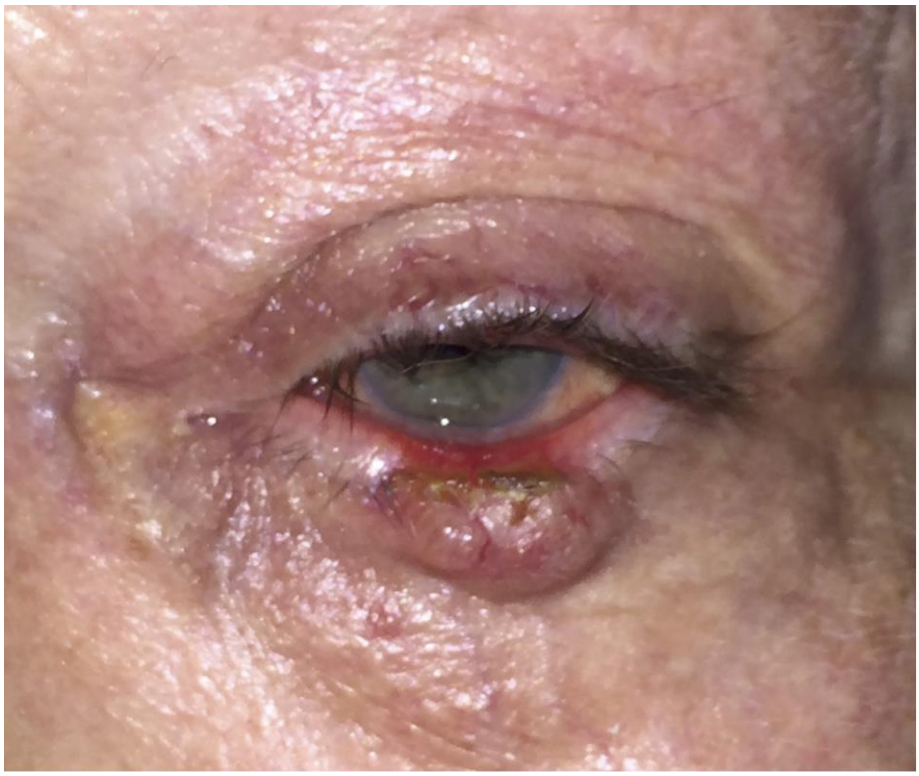


Figure 6. Lacrimal ectropion of the right lower eyelid (top) corrected with a Lazy-T procedure (bottom).

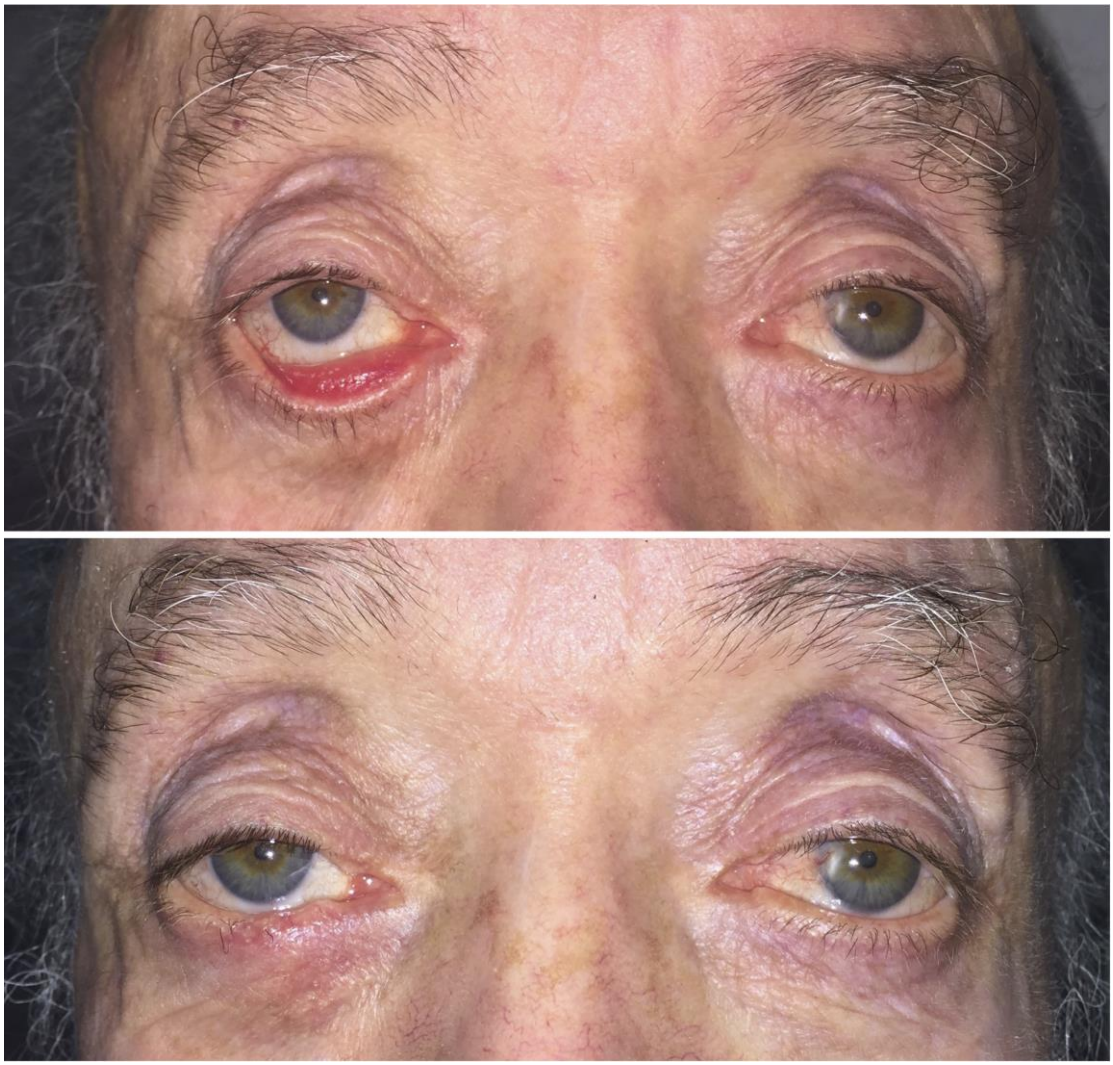
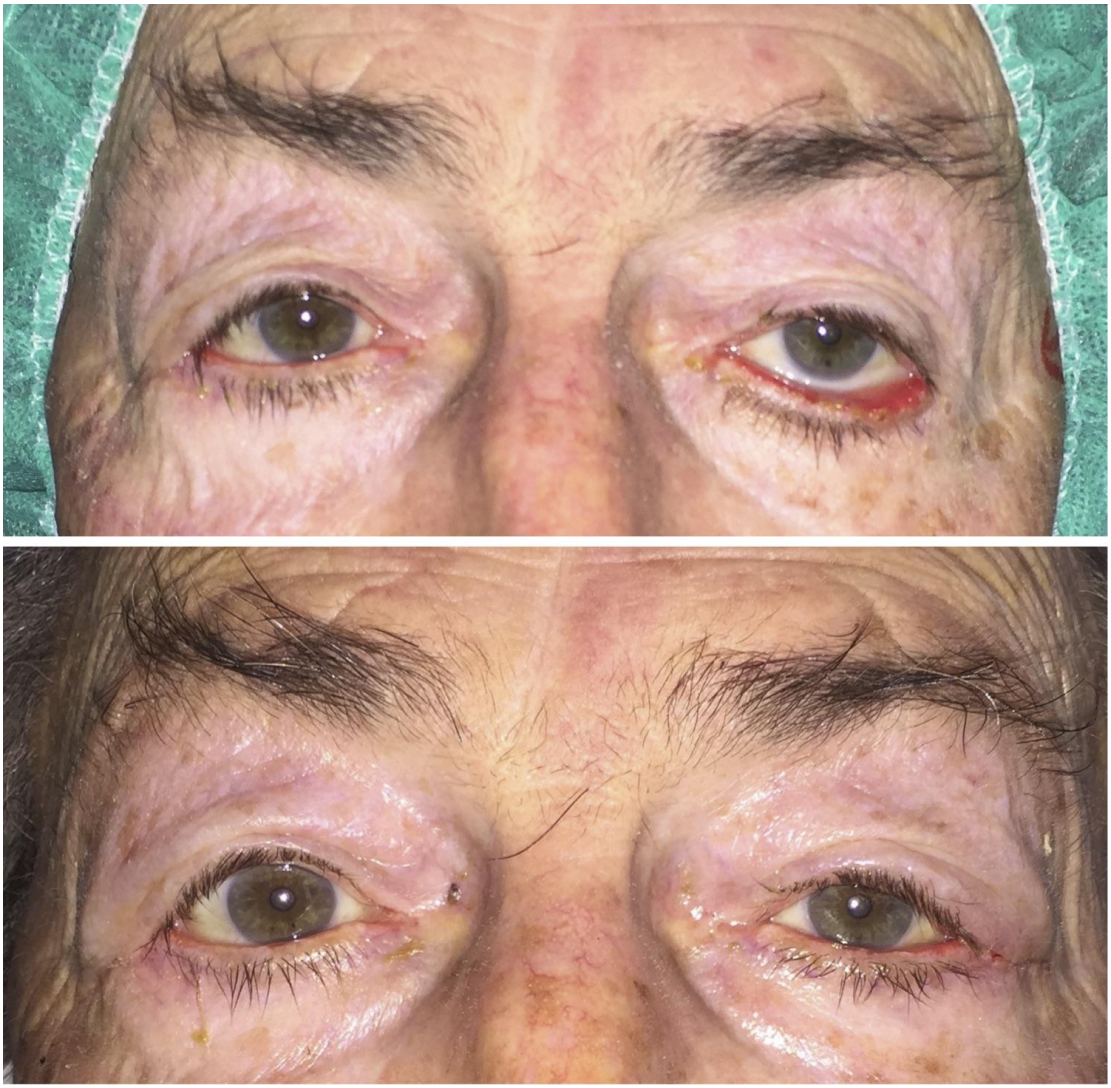


Figure 7. Left involutional lower lid ectropion. Top: Preoperative appearence. Bottom: postoperative (tarsal strip) result.



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Anexos

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SDC Call-outs. SDC must be cited consecutively in the text of the submitted manuscript. Citations should include the type of material submitted (Audio, Figure, Table, etc.), be clearly labeled as "Supplemental Digital Content," include the sequential list number, and provide a description of the supplemental content. All descriptive text should be included in the call-out, as it will not appear elsewhere in the article. Example: We performed many tests on the degrees of flexibility in the elbow (see Video, Supplemental Digital Content 1, which demonstrates elbow flexibility) and found our results inconclusive.

List of SDC. A listing of SDC must be submitted at the end of the manuscript file. Include the SDC number and file type of the SDC. This text will be removed by our production staff and not be published. Example: Supplemental Digital Content 1.wmv.

SDC File Requirements. All acceptable file types are permissible up to 10 MBs. For audio or video files greater than 10 MBs, authors should first query the journal office for approval. For a list of all available file types and detailed instructions, please visit http://links.lww.com/A142.

IMAGES

Photomicrographs of histopathologic sections must be submitted in color. Authors are encouraged to submit other figures in color, when appropriate. The cost to authors for color reproduction is $100 per figure. A figure can comprise one or more images/figure parts. Color costs can be reduced by judicious grouping of color images into composite figures. If figures are submitted in color, it is assumed the author intends to pay for color reproduction.

Do not paste figures into word processing documents; submit them as separate files, without their captions. Label each file with its figure number and upload the figures in numerical order.

The following summarizes our printer's guidelines for image preparation. Additional details can be found at http://cpc.cadmus.com/da/guidelines.asp. Please follow these guidelines carefully. Image manipulation by the printer will substantially increase the cost to authors.

Please note: *Images should be submitted in TIFF format. JPEG, GIFF, PowerPoint, Excel, CorelDRAW, Quattro Pro, MS Word, and downloaded Internet image files are not acceptable at this time.*

Resolution: The minimum requirements for resolution are:
● 1200 DPI/PPI for monochrome.
● For purely black and white images, such as line graphs and artistic renderings.
● 300 DPI/PPI for halftones (CMYK/grayscale).
For color or black-and-white images containing pictures only, including photographs not containing text labeling or thin lines.
● 600 DPI/PPI for combination halftones (CMYK/grayscale)
For color or black-and-white images containing pictures and text labeling and/or thin lines.

Lower resolutions may compromise print quality; higher resolutions will not improve output quality and will only increase file size.

Color Mode. Color images must be submitted in CMYK (cyan, magenta, yellow, black) mode, **not** RGB (red, green, blue) mode. Radiographs should be submitted in grayscale mode. Black-and-white line art can be submitted in grayscale or bitmap mode.

Cropping and sizing. All graphics should be submitted at their actual size; that is, they should be 100% of their print dimensions so that no scaling is necessary. Images should fit a column width of 3.5 inches. Crop figures (or change the pagesize of your document) so that no unnecessary white space is left bordering the figure.

Line Art. Line art must be submitted as a TIFF file at a resolution of 1200 dpi. If prepared in PowerPoint or Excel, line art can be imported into Photoshop and converted to TIFF format or can be printed on a photoquality printer and then rescanned at 1200 dpi.