Journal of Oral and Dental Care

*Case Report*

# Orbital Dermoid Cyst: A Case Report and Our Five-Year Experience

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## ABSTRACT

**Objectives:** The aim of this work is to determine the clinical-histological characteristics and the treatment of the orbital dermoid cyst, a benign choristoma, relatively common in pediatric age but rather rare in adults. Clinically, it may be associated with unilateral proptosis, diplopia, alteration of the lateral temporal visual field, and limitation of ocular motility; it often appears visible and palpable on physical examination.

**Materials and Methods:** We described the clinical and histological characteristics of the Orbital Dermoid Cyst, and the data from the literature review were compared with ours, collected over 5 years of clinical activity at the Oral and Maxillofacial Surgery Unit of the University Hospital "Our Lady of Good Counsel." In our Case Report, we present the preparation of the coronal flap and orbital osteotomy using Sonic-Surgery instrumentation, which ensures greater precision in osteotomy, reduced edema formation, increased safety, and preservation of noble anatomical structures.

**Results:** The prognosis of the Dermoid Cyst is certainly favorable, and if the surgical removal is properly planned and performed, it can result in a 100% restitutio ad integrum. The main difficulty lies in respecting the loco-regional anatomy, which is rather complex and variable. Between March 2021 and February 2026, we reported in our case series 2 cases of orbital dermoid cyst. The incidence in our patient sample was 0,23%.

**Conclusions:** We can therefore conclude that the orbital dermoid cyst is a benign disembryogenetic lesion of the soft tissues, frequent in pediatric age but relatively rare in adults. It requires correct diagnosis and complete surgical removal in order to achieve an excellent prognosis and prevent the risk of recurrence.

## KEYWORDS

Orbital dermoid cyst, Dermoid cyst, Orbital choristoma, Orbital surgery, Pediatric orbital lesions.

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## Introduction

The dermoid cyst is a benign congenital cystic teratoma, also defined as a choristoma, that is, tissue composed of histologically normal cells located in an abnormal position [1-4]. It originates from embryonic developmental anomalies, which lead to the inclusion of superficial ectodermal elements within the underlying mesenchyme during the closure of the neural tube, along fetal suture lines. This explains, from a histological point of view, the presence of cutaneous adnexa such as hair follicles, sweat glands, sebaceous glands, and even teeth, lined by keratinized stratified squamous epithelium and enclosed by a fibrous wall, which distinguish it from the more common epidermoid cyst [1,5,6]. Based on its relationship with suture lines, the dermoid cyst can be classified as juxtasutural (not firmly attached to the suture), sutural (firmly attached to the suture and often associated with bone erosion), and of the soft tissues; as well as intraosseous and extraosseous, intraorbital and extraorbital; superficial and deep [1,7]. Most orbital dermoid cysts, in particular, are located in relation to the frontozygomatic suture, especially in the temporal and superotemporal area [2]. The aim of our work is to determine, with greater clarity, the clinical-histological characteristics, clinical behavior, differential diagnosis with other clinically similar pathologies, and the surgical treatment of the dermoid cyst of the orbital cavity. Dermoid cysts are located in 80% of cases in the head and neck region and represent approximately 10% of all orbital masses, most commonly located in the superolateral angle of the orbital rim [1,7]. Clinically, it may be associated with unilateral proptosis, diplopia, alteration of the lateral temporal visual field, and limitation of ocular motility; it often appears visible and palpable on physical examination [1,5]. The clinical features that guide diagnosis are the consistency of the lesion, slow expansive growth, the presence of a capsule that makes it easily enucleable, and the absence of vascular supply, which directs the diagnosis away from orbital rhabdomyosarcoma. Other prognostic factors to consider include the presence of small inflammatory pseudocystic satellite lesions, which develop as a consequence of the relationship of the neoformation with the frontozygomatic suture, significantly increasing lesion recurrence; this is because, unlike other cystic neoformations, dermoid cysts are not monolithic lesions. Furthermore, their subperiosteal localization is the most invasive in terms of bone extension and likelihood of recurrence.

## Case Report

The patient G.R., male, 37 years old, presented to our observation at the Oral and Maxillofacial Surgery Unit of the University Hospital "Our Lady of Good Counsel" in Tirana, complaining of the presence for at least 8–9 years of a mass in the orbital cavity, located at the frontozygomatic margin, causing discomfort, limitation of the motility of the right eye, and mild difficulty in abduction movements. The condition, however, not associated with pain or fever, was described as having a slow and progressive onset. The patient's general health remained unchanged, without causing any other disturbances. On ophthalmological examination, no signs of proptosis, strabismus, dysfunction of the extraocular muscles, or any visual deficit were detected. The physical examination, however, revealed a slight compressible, mobile, non-tender protrusion in the superolateral region of the right eye. An MRI of the facial massif and neck was therefore requested, performed with axial, coronal, and sagittal scans, weighted in T1, T2, and FLAIR, which showed a neoformation of probable cystic etiology measuring approximately 20×20×12 mm in the right superolateral extraconal compartment, hyperintense in T1- and T2-weighted images and hypointense in FLAIR, which did not extend into the bone tissue and was positioned without invasion of the periosteal membrane [5]. The mass caused slight compression of the right superior and lateral extraocular muscles, with consequent limitation of abduction of the right eye, but without involvement of surrounding structures such as the optic nerve and intraconal periorbital fat. The MRI examination did not show any alteration of the lymph node stations of the laterocervical transverse system

The CT scan of the facial massif, in comparison, confirmed the presence of a well-circumscribed, encapsulated extraconal fluid mass, located on the superolateral wall of the right orbit, without any sign of bone remodeling and without subperiosteal invasion. The presumptive clinical diagnosis suggested the presence of a neoformation of probable cystic etiology located within the right orbit, with surgical indication for radical excision [5]. After routine blood tests and anesthesiological evaluation, the patient was scheduled for surgery involving en bloc removal [2] of the neoformation together with its capsule, through a surgical approach with the creation of a coronal scalp flap [8-10], with conservative osteotomy of the lateral orbital margin and subsequent repositioning of the bone block with rigid fixation using plates and screws. Sterile preparation of the surgical field was performed with 7.5% povidone-iodine (Figure 1); after decontaminating and protecting the hair with specific hair-guards, isolating them from the surgical access area, a skin incision was made anterior to the external auricle, in the tragus region, extending to the contralateral area (Figure 2). The incision was extended through the skin, subcutaneous tissue and galea aponeurotica, reaching the subgaleal plane, controlling and cauterizing the perforating vessels. Subsequently, the flap was elevated and mobilized anteriorly by dissection in the subgaleal plane: this plane is relatively poorly vascularized and allows easy dissection [8,9]. During this phase, the cutaneous-galeal flap was progressively reflected anteriorly until reaching the frontal region and the superior orbital margin involved in our surgical procedure for the removal of the intraorbital neoformation. Particular attention was paid to the preservation of neurovascular structures: in the frontal region, the supraorbital and supratrochlear nerves were identified and protected [8,9]. After exposing the lateral bony wall of the orbital cavity (Figures 3,4), osteosynthesis plates were positioned as surgical reference points (Figure 5), for correct repositioning of the bone fragment after osteotomy. With the aid of a ribbon retractor placed inside the lateral orbit, the eyeball and orbital contents were protected during the osteotomy performed with Sonosurgery®, on which a specific osteotomy insert was mounted, creating a superior horizontal osteotomic cut (Figure 6) and an inferior one at the level of the frontozygomatic suture (Figure 7), thus obtaining a bone flap subsequently mobilized (Figure 8) and preserved in sterile saline solution [8,9]. The choice of osteotomy performed with the sonosurgical technique was

made due to the greater precision of cutting and the greater respect for noble anatomical structures. Sonosurgery® is a minimally invasive surgical technique based on the use of sonic vibrating instruments with a frequency of approximately 6,000 Hz for the selective cutting of hard tissues (bone). Its specific ultra-thin inserts, designed by Dr. Agabiti, allow osteotomic cuts with a thickness of approximately 0.18 mm, minimizing bone tissue loss during the procedure. The particular 3D orbital oscillation allows a three-dimensional movement of the insert, making the entire surface of the bur operative and not only the tip, as in the classical piezoelectric technique, allowing modification of the axis or cutting position with simple lateral pressure when needed [4,11]. Another undeniable advantage of the Sonosurgery technique is that sonic frequencies greatly reduce friction and heat production, preserving osteoblast cellular vitality and promoting faster healing. Furthermore, the surgical field remains cleaner thanks to the cavitation effect and the reduced need for massive irrigation, facilitating the surgeon's work [12,13]. Once the neoformation was visualized, confirming its position in the superolateral wall of the orbit (Figure 9), en bloc removal was performed, taking particular care to include its capsule (Figure 10) to avoid dissemination of the contents with consequent inflammatory reactions [2]. The presence of cutaneous adnexa such as hairs within the lesion should be noted (Figure 11). At the end of the procedure, the lateral wall of the orbit was reconstructed by correct repositioning of the osteotomized fragments using the previously applied plates (Figure 12); the deep layers were then sutured with Polyglactin 910 (4/0), and finally the coronal flap was sutured using intradermal Nylon 5/0 sutures. The patient was dressed with Xeroform gauze and head bandaging with a self-adhesive compressive dressing. Pharmacological therapy included Dexamethasone 8 mg in slow infusion with 500 cc of saline, paracetamol 1000 mg twice daily and ceftriaxone 1 g for 5 days intravenously. The postoperative course showed no complications; correct motility of the right eye was immediately confirmed (Figure 13) and at the follow-up visit 20 days after surgery, the patient showed no visible scar (Figure 14).

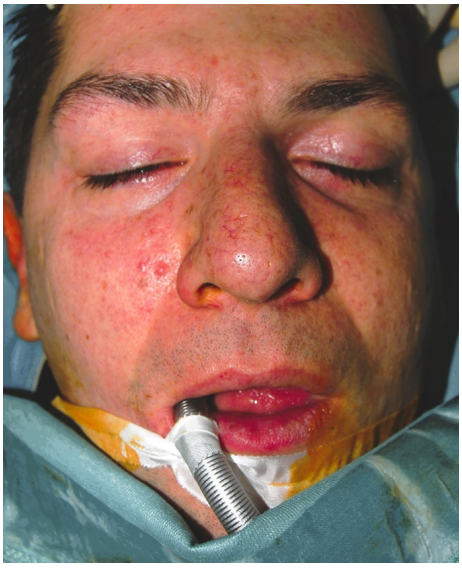

**Figure 1:** Patient Preparation for surgery.

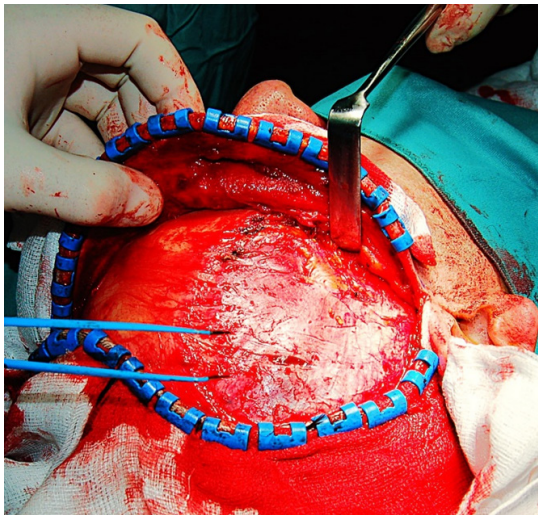

**Figure 2:** Elevation of the Coronal Flap.

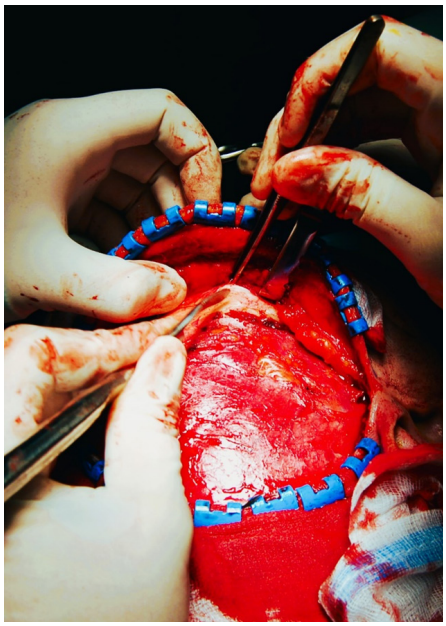

**Figure 3:** Preparation of the Lateral Orbit Wall.

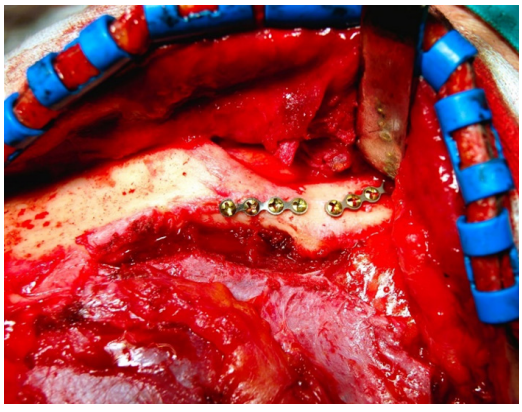

**Figure 4:** Exposure of the Lateral Bony Wall of the Orbit to access the Orbital Cavity.

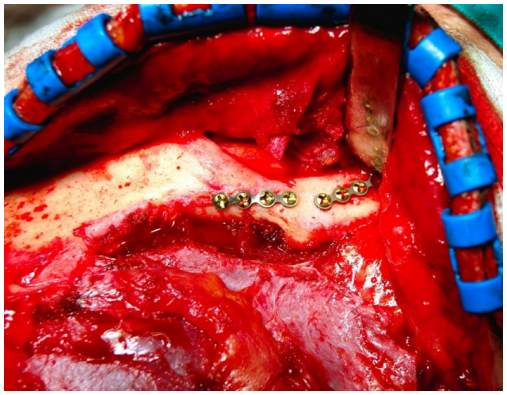

**Figure 5:** Placement of Osteosynthesis Plates as Surgical Landmarks.

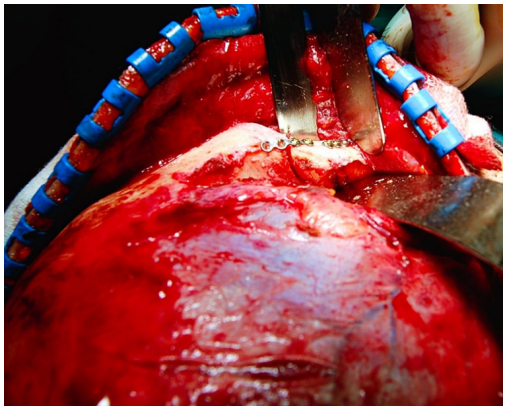

**Figure 6:** Superior Osteotomy of the Lateral Wall of the Orbital Cavity.

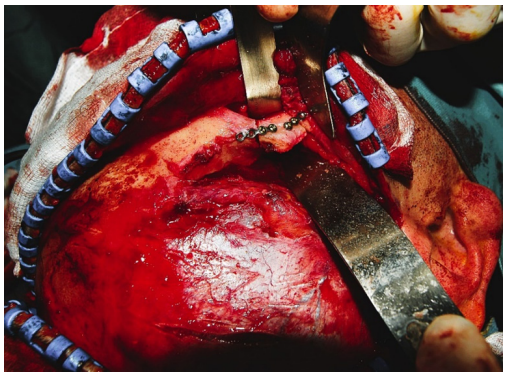

**Figure 7:** Inferior Osteotomy of the Lateral Wall of the Orbital Cavity.

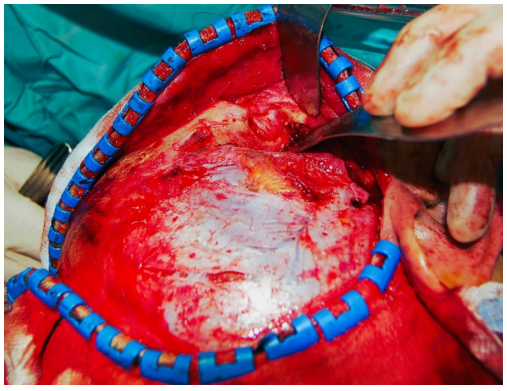

**Figure 8:** Removal of the Bony Flap and Access to the Orbital Cavity.

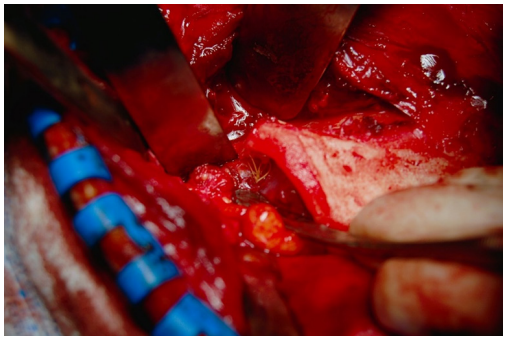

**Figure 9:** Visualization of the Lesion in the Superolateral Orbit Wall.

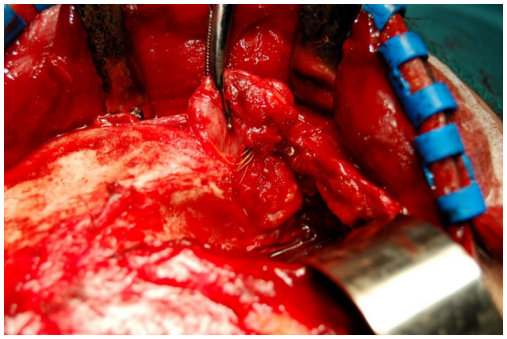

**Figure 10:** Complete Excision after Proper Enucleation.

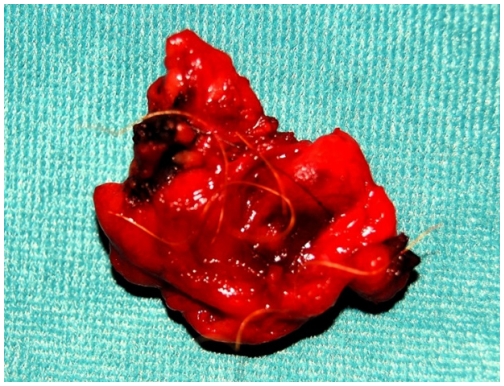

**Figure 11:** Surgical Specimen.

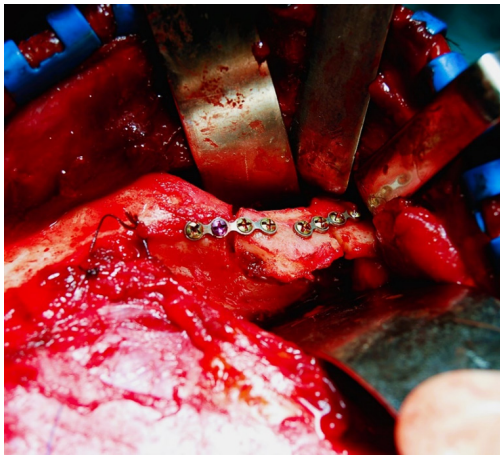

**Figure 12:** Proper Repositioning of the Lateral Bony Flap, facilitated by the Previously Placed Plates.

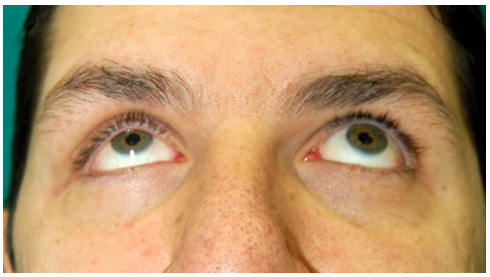

**Figure 13a:** Verification of Normal Ocular Motility.

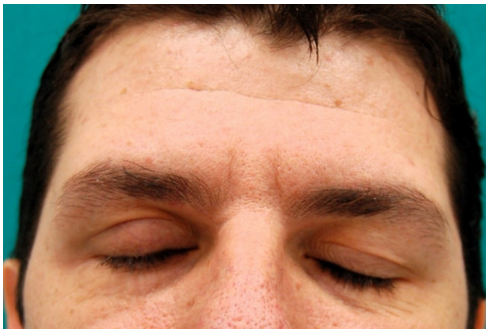

**Figure13b:** Verification of Normal Ocular Motility.

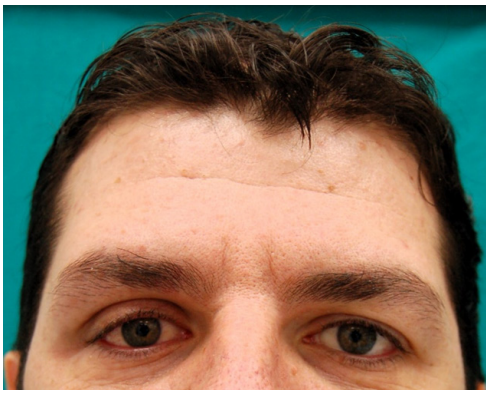

**Figure 14:** Postoperative Check at 20 days, noting the absence of scars.

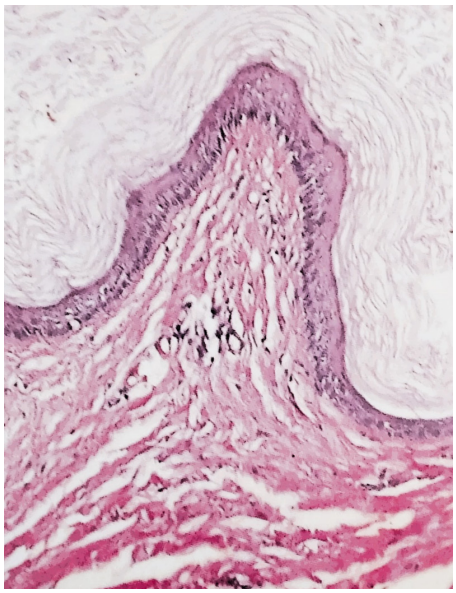

**Figure 15:** Particular Hair Follicles and Skin Appendages.

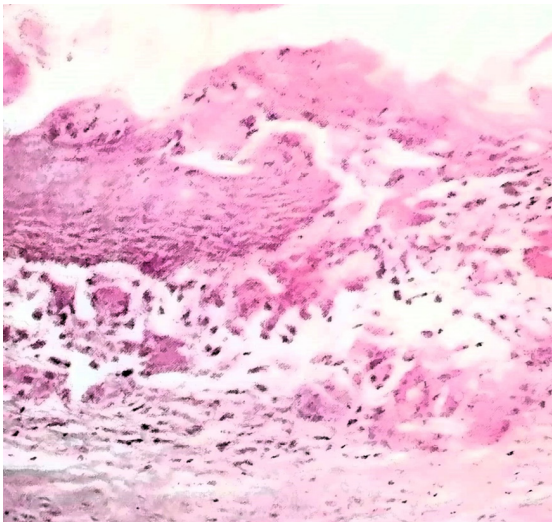

**Figure 16:** Multinucleated Giant Cells into Dermoid Cyst.

The histopathological examination of the neoformation revealed: "A well-defined cystic neoformation, entirely surrounded by a fibrous connective tissue wall. The cystic cavity is lined by keratinized stratified squamous epithelium with the presence of mature cutaneous adnexa represented by active hair follicles and sebaceous glands" (Figures 15,16). The diagnosis is therefore consistent with "Orbital Dermoid Cyst".

## Discussion

The dermoid cyst is a choristoma originating from aberrant primordial tissue and is often evident shortly after birth. Although this lesion can occur in any part of the body, it is mainly found in the orbital region, especially in pediatric age (40% of orbital lesions in children and 89% of all cystic orbital lesions in childhood), representing approximately 3–9% of all orbital masses and 0.04–0.6% of orbital neoformations [2,3,5]. The aim of our study was to retrospectively evaluate the incidence of orbital dermoid cysts over five years of clinical activity at the Oral and Maxillofacial Surgery Unit of our hospital. During this period, we analyzed 1,646 patients, 53% of whom were male (872 subjects) and 47% of whom were female (774 subjects); the mean age was 53.3 years in females and 56.7 years in males. Between March 2021 and February 2026, we recorded two diagnoses of orbital dermoid cysts, both in males, with an incidence in our patient sample of 0.23% per 1,000 patient-years, with a calculated prevalence rate of 0.12%. Although malignant transformation of this lesion is extremely rare, en bloc surgical excision with the attached fibrous capsule remains the treatment of choice, not only to relieve symptoms caused by the mass in the periorbital region, but above all to prevent potential intracranial extension and avoid dissemination of the contents, which could cause an acute inflammatory response. Furthermore, it prevents the deposition of cells that could form a new cystic lesion at the same surgical site [2,3]. The approach using a coronal scalp flap offers numerous advantages, including wide exposure of the fronto-orbito-zygomatic region, the possibility of simultaneously accessing multiple craniofacial structures and a scar that is generally

well hidden within the hair. It also allows preservation of important neurovascular structures involved in social function, such as the VII cranial nerve [8-10]. However, the procedure requires detailed knowledge of loco-regional anatomy to avoid complications such as facial nerve injury, paresthesia of the supraorbital or supratrochlear nerves, scalp hematomas, cicatricial alopecia, or postoperative infections [8]. Moreover, the experience of our school places great importance on choosing the correct osteotomy technique, which improves the precision of the osteotomic cut, reduces the amount of destroyed bone tissue, protects bone cells at the site for faster healing, and ensures greater safety in the intraoperative management of noble anatomical structures in such a delicate region of the body. Histologically, a dermoid cyst of the orbit appears as a cystic growth internally lined by keratinized stratified squamous epithelium. The main microscopic details observed are the following: the cyst is lined by a squamous epithelium that produces keratin, which tends to accumulate in the lumen; the distinguishing feature that differentiates it from an epidermoid cyst is the presence of mature skin appendages within the wall. These include hair follicles, sebaceous glands, and sweat glands. Within the cavity are lamellar keratin scales, as well as lipid and oily material, likely sebum, and occasionally hair (Figure 15). If the cyst wall ruptures, the release of the sebaceous contents and keratin into the surrounding orbital tissues triggers a granulomatous foreign body reaction. Histologically, in this setting, we observe multinucleated giant cells (Figure 16), histiocytes, and a chronic inflammatory infiltrate surrounding the keratin debris.

## Conclusions

We can therefore conclude that the case we examined is consistent with the clinical and histopathological characteristics reported in the scientific literature, confirming the importance of multidisciplinary collaboration among specialists within the medical team to achieve accurate diagnosis and therapeutic success. We would also like to emphasize how the choice of Sonosurgery as an alternative technique for osteotomic instrumentation improves cutting precision thanks to its ultra-thin inserts (0.18 mm), allows faster healing also due to greater respect for residual cells, and ensures equal safety of loco-regional noble structures, while involving significantly lower costs for the acquisition of instrumentation compared to alternatives currently available on the market [4,11-13].

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