Transorbital surgical approaches in Otorhinolaryngology – case series

Original Article

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Article received on April 14, 2026.
Accepted for publication on June 2, 2026.

Abstract

Introduction: Transorbital surgical approaches allow access to various orbital, periorbital, and skull base structures, and can be used either alone or in combination with other techniques.
Objective: To systematize the main aspects related to the use of transorbital approaches in otorhinolaryngology.
Materials and Methods: Literature review on the principles, indications, and techniques of superior, lateral, medial, and inferior transorbital approaches, illustrating their applicability with three clinical cases: drainage of a frontal mucocele with orbital extension, lateral orbital wall decompression, and drainage of a subperiosteal abscess.
Results: Transorbital approaches enable direct and minimally invasive surgical management of a wide range of pathologies, allowing rapid recovery and excellent functional and aesthetic outcomes. Their execution requires thorough knowledge of periorbital anatomy, careful surgical planning, and a multidisciplinary approach.
Conclusion: Transorbital approaches are versatile, safe, and effective techniques with increasing relevance in the surgical armamentarium of the otorhinolaryngologist.
Keywords: Orbit; Skull base; Transorbital approaches; Minimally invasive surgery; Endoscopic surgery; Multidisciplinary approach.

Introduction

The orbit, an anatomical space at the intersection of otolaryngology and ophthalmology, can serve as an important surgical corridor to several anatomical regions of the skull base and facial skeleton, particularly because of its strategic location directly adjacent to approximately 80% of the anterior cranial fossa and to a significant portion of the middle cranial fossa.[1]

Although systematic reports on transorbital surgical techniques did not appear in the literature until 2010, and the number of reported cases therefore remains relatively limited, these approaches are attracting growing interest in skull base surgery because they provide minimally invasive, target-directed access to previously hard-to-reach anatomical areas, with a seemingly excellent safety and efficacy profile.[1,2]

In transorbital surgical techniques, unlike in endonasal endoscopic surgery, where preformed "anatomical corridors" are used to reach the target structures, the orbital cavity acts as a "passageway" for the endoscope and other surgical instruments, allowing a surgical trajectory directed at the target. Depending on the location of the lesion, these trajectories can be directed through different orbital quadrants—superior, lateral, medial, or inferior—making the spectrum of surgical targets accessible through these approaches extremely broad, including the orbit and optic nerve, paranasal sinuses, cavernous sinuses, and anterior and middle cranial fossae, among others.[1,2] In addition to being used alone, transorbital methods can also be combined with endoscopic endonasal techniques or traditional neurosurgical approaches via craniotomy. The main advantages of combined techniques are the ability to expand the surgical working space and obtaining multiple views of the operative field.[2,3]

This article reviews the main aspects of transorbital approaches, both in general terms and particularly for each access route—superior, lateral, medial, and inferior—illustrating the topic with three clinical cases and emphasizing its relevance in otolaryngology.

Materials and Methods

A review of the existing literature on the use of transorbital surgical techniques was conducted, with a particular emphasis on their general principles, potential indications and contraindications, and a description of their different access routes—superior, lateral, medial, and inferior—including the main anatomical landmarks to consider in each quadrant. Three clinical cases of patients who underwent transorbital surgery are also presented: drainage of a frontal sinus mucocele with orbital extension, decompression of the lateral orbital wall in the setting of thyroid disease, and drainage of a subperiosteal abscess of the inferior orbital wall.

Results

Transorbital surgical approaches are feasible because, in an adult, the globe occupies, on average, only 6–7 mL of the 30 mL orbital volume, leaving space for the creation of surgical corridors. Additionally, because the optic nerve has approximately 1 cm of slack—necessary for rotation of the globe—a certain degree of temporary retraction of the orbital contents is possible and safe, facilitating exposure of the surgical field in these approaches.[1-3] Transorbital approaches are classified according to the orbital quadrant in which they are conducted: superior, lateral, medial, and inferior, as illustrated in Figure 1. The selection of the most appropriate transorbital route in each case is based on the anatomical location of the lesion; the main structures accessible through each route are summarized in Table 1. The main indications for this type of surgery include the excision of benign tumors (e.g., meningiomas, neurofibromas, and cystic or vascular lesions)

Figure 1
Division of the four transorbital approaches according to the orbital quadrants in which they are conducted. (S: superior; L: lateral; M: medial; I: inferior; LG: lacrimal gland; T: trochlea; IO: inferior oblique muscle; OC: optic canal; SOF: superior orbital fissure; IOF: inferior orbital fissure).

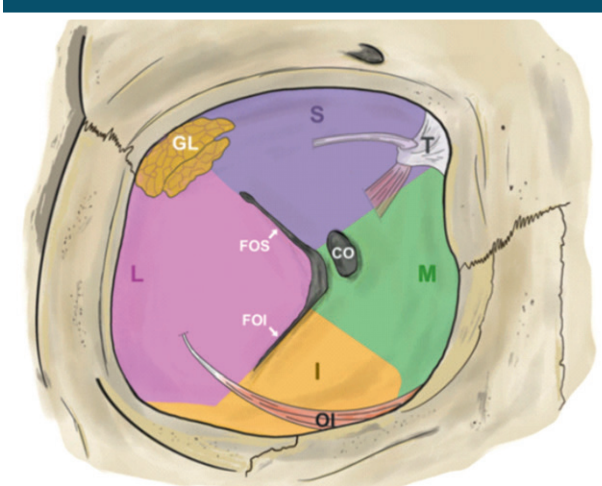


Table 1
Anatomical structures accessible through each of the four transorbital routes.

Approach	Anatomical structures
Superior	Superior orbital contents; Orbital roof; Frontal sinuses; Frontal intersinus septal cells; Anterior cranial fossa; Frontal lobe; Superior orbital fissure.
Lateral	Lateral orbital contents; Lateral orbital wall; Lateral portion of the anterior cranial fossa; Middle cranial fossa; Temporal lobe; Infratemporal fossa; Lateral region of the sphenoid sinus; Cavernous sinus; Meckel cave; Petroclival region; Superior and inferior orbital fissures; Orbital apex.
Medial	Medial orbital contents; Medial orbital wall; Anterior cranial fossa; Contralateral middle cranial fossa; Ethmoidal arteries; Sellar and parasellar region; Cavernous sinus; Optic nerve; Orbital apex.
Inferior	Inferior orbital contents; Orbital floor; Maxillary sinus; Middle cranial fossa; Pterygopalatine fossa; Infraorbital nerve; Foramen rotundum; Sellar and parasellar region; Inferior orbital fissure.

or malignant tumors of the orbital and periorbital region, repair of cerebrospinal fluid (CSF) leaks, drainage of mucoceles originating from the surrounding paranasal sinuses, drainage of subperiosteal, epidural, or subdural hematomas or abscesses, posttraumatic orbital repair, targeted biopsies, or orbital decompression.[1-5] The main advantages of transorbital approaches stem from their minimally invasive nature: they follow the shortest and most direct surgical path possible, which results in lower morbidity, shorter hospital stays, and faster recovery compared with conventional craniofacial approaches as well as a lower risk of postoperative cerebral edema. In addition, these procedures have minimal functional and aesthetic impact, with no visible scarring in most cases.[1-3]

A complete preoperative ophthalmologic evaluation is essential in these patients, both to rule out preexisting abnormalities and to exclude absolute contraindications—globe rupture or hyphema—and relative contraindications—intraocular surgery within the previous 6 months, active orbital infection or inflammation, or reduced corneal sensation (owing to a higher risk of postoperative complications). These patients should also undergo a complete neurological evaluation, with a particular emphasis on the function of cranial nerves II–VI, given that these nerves may be manipulated during surgery. Finally, preoperative planning based on detailed imaging (computed tomography and/or magnetic resonance imaging) is also crucial as it enables the use of intraoperative navigation systems, increasing the precision and safety of the procedure.[1-3]

Intraoperatively, considering the potential traction on the globe, the pupillary diameter must be monitored every 15–30 minutes (or more frequently when dissection approaches the orbital apex). If mydriasis or pupillary irregularity is observed, all surgical instruments must be removed until the baseline pupillary state is restored. Traction on the globe can also trigger the oculocardiac reflex, causing bradycardia, arrhythmia, or asystole due to the increased parasympathetic tone of the sinoatrial node resulting from stimulation of the ciliary ganglion. In such cases, all surgical instruments must likewise be removed until the baseline heart rhythm is reestablished, and antimuscarinic drugs may be required. During surgery, corneal protection must also be ensured, either with a lubricated corneal shield (which requires the frequent removal and reapplication to monitor the pupil) or with a temporary lateral or medial tarsorrhaphy (which allows eyelid separation for pupillary visualization).[1-3]

With proper surgical technique, intraoperative and postoperative complications are infrequent. One of the most important intraoperative complications is the development of a CSF leak, which can be promptly repaired during the procedure according to conventional reconstructive principles, using fat, fascia lata, or synthetic materials. To control edema, intraoperative corticosteroid therapy can be used and may be continued postoperatively, along with cold compresses during the first 48 hours. In cases in which significant chemosis or proptosis is present at the end of surgery, a temporary tarsorrhaphy may be performed for 3–5 days.[1,2]

Superior Approach

The boundaries of the superior orbital quadrant, where the superior transorbital approach is carried out, are the trochlea (medially) and lacrimal gland (laterally), and the posterior boundaries are the optic nerve (medially) and superior orbital fissure (laterally) – Figure 1.[2,3] The surgical approach begins with a skin incision in the upper eyelid crease (blepharoplasty-type incision), approximately 6–10 mm above the upper eyelid margin (Figure 2A). Because it follows a natural eyelid crease, this incision yields excellent aesthetic outcomes, making the scar quickly imperceptible. Subsequently, the incision is deepened, transecting the orbicularis oculi muscle until the correct dissection plane is reached: deep to the orbicularis muscle and superficial to the orbital septum. The correct identification and maintenance of this plane—the preseptal plane—are crucial to avoid intraoperative herniation of orbital fat and to prevent injury to the levator palpebrae superioris muscle and its aponeurosis, whose integrity is essential to avoid postoperative eyelid ptosis. Dissection proceeds superiorly in the preseptal plane until the periosteum of the superior orbital rim is reached; the periosteum is then incised along the posteroinferior margin of the rim. At this stage, controlled inferior traction of the upper eyelid, globe, and periosteum should be applied with malleable retractors; excessive retraction must be avoided to prevent injury to the levator muscle. It is also crucial to identify and preserve the supratrochlear and supraorbital neurovascular bundles, since injury to them can result in prolonged hypoesthesia of the frontal region. Elevation of the periosteum allows structures located on the orbital surface of the periosteum, such as the trochlea and lacrimal gland, to be mobilized inferiorly, improving exposure of the surgical field. Dissection should then continue posteriorly in the subperiosteal plane until the intended anatomical target is reached, depending on the specific lesion. If necessary, the orbital roof can be drilled to reach structures such as the frontal sinus or anterior cranial fossa; bone reconstruction of the region is usually not required unless a large craniectomy is performed—the patient may only experience a "pulsation" in the orbit due to direct contact with the dura mater; this sensation usually resolves spontaneously 2 weeks after surgery. At the end of the procedure, layered closure should be performed: first, the periosteum with simple interrupted 5-0 Vicryl sutures, then the orbicularis oculi muscle (5-0 Vicryl), and finally the skin incision with a running 6-0 nylon suture.[1-5] As an alternative to the skin incision described above, a supraorbital incision can also be made in the region immediately below the eyebrow; however, it yields significantly worse aesthetic outcomes.[4] In addition to being used in isolation, the superior transorbital approach can be easily combined with a lateral transorbital approach by extending the upper eyelid crease incision laterally (with preservation of the lateral canthus) and retracting the lacrimal gland inferomedially, or with a more medial approach by retracting the trochlea of the superior oblique muscle inferolaterally.[1,3,4]

Lateral Approach

The anterior boundaries of the lateral orbital quadrant are the lacrimal gland (superiorly) and the orbital floor (inferiorly), and the posterior boundaries are the superior orbital fissure (superiorly), the inferior orbital fissure (inferiorly), and the optic nerve (medially) – Figure 1.[3]

Two main incisions are possible in this transorbital approach: the transconjunctival incision, used to avoid skin incisions and therefore associated with better aesthetic outcomes (ideal for simpler, more localized procedures, such as biopsies); and the transcutaneous incision, which is the most commonly used approach because it provides direct access to the superolateral orbital rim, allowing better visualization and wider access to the surgical field, which is particularly useful for larger lesions and/or lesions extending more superiorly in the orbit.[1-4]

The transconjunctival, or lateral retrocanthal, approach begins with an incision in the conjunctiva, posterior to the insertion of the lateral canthal tendon—approximately 2 mm posterior to the lateral orbital rim and anterior to the lacrimal gland (Figure 2B). This incision should be deepened until the periosteum of the orbital rim is reached, which must also be incised to access the subperiosteal space. At this stage, the incision can be extended both superiorly and inferiorly as needed; when extending the incision superiorly, it is crucial to preserve the lateral insertion of the levator palpebrae aponeurosis. If greater exposure is required, a lateral canthotomy, or even a cantholysis, can also be performed; in these cases, repair of the lateral canthal tendon with a 5-0 non-absorbable suture is required at the end of surgery. Controlled medial traction of the periosteum, lacrimal gland, and globe should then be applied with malleable retractors, allowing dissection to advance posteriorly in the subperiosteal plane until the intended anatomical target is reached; the violation of this plane results in lateral fat herniation, which complicates subsequent surgical steps. During posterior progression of the dissection, care should be taken to identify the zygomaticofacial and zygomaticotemporal neurovascular bundles, as well as the recurrent branch of the middle meningeal artery, which can be cauterized and transected if required. At the end of the procedure, layered closure should be performed, although conjunctival closure is not always necessary.[1-5]

The transcutaneous incision is made approximately 8–10 mm above the upper eyelid margin, along a natural eyelid crease, extending approximately 1 cm lateral to the lateral orbital rim—an upper blepharoplasty-type incision with lateral extension (Figure 2A). As in the superior approach, an incision is made in the orbicularis oculi muscle, followed by dissection in the preseptal plane until the lateral orbital rim is reached, where the periosteum is incised. Once the subperiosteal space is accessed, the dissection details in this anatomical space are similar to those described for the transconjunctival approach, with the caveat that, if the dissection takes a more superior course, the anatomical details described for the superior transorbital approach must also be considered. At the end of the procedure, closure should be performed in layers, as described for the superior approach.[2,4]

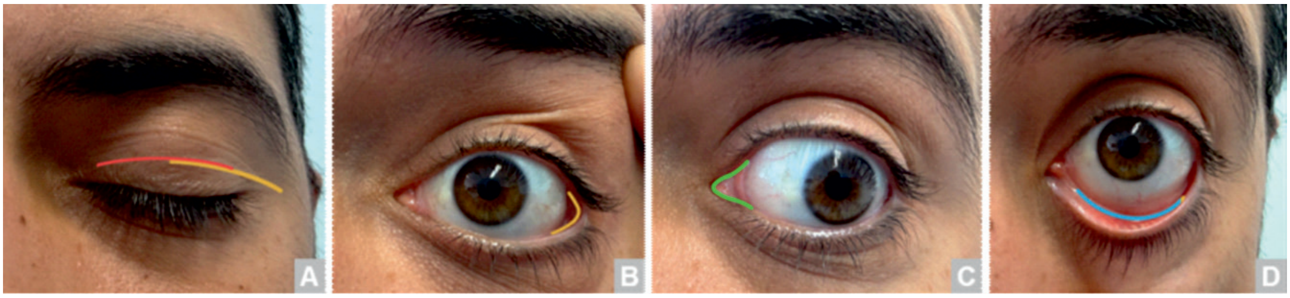
In this type of approach, drilling of the lateral orbital wall is commonly conducted – for orbital decompression (in which, after creation of a lateral bony window, an incision is made in the periorbita to relieve pressure), for access to the intracranial region, or simply to increase the volume of the surgical working field. In these cases, unless a very extensive bone resection is performed, bone reconstruction is not necessary.[2,4,5]

Medial Approach

The anterior boundaries of the medial orbital quadrant are the trochlea (superiorly) and the insertion of the inferior oblique muscle (inferiorly), and the posterior boundary is the optic nerve (laterally). Despite these boundaries, to improve surgical exposure in this approach, both the trochlea and the insertion of the inferior oblique muscle can be retracted laterally during dissection in the subperiosteal plane, since they lie on the orbital surface of the periosteum.[3,4]

Detailed knowledge of the anatomy of the medial canthal region is essential for conducting medial transorbital approaches. This region is formed by the anterior and posterior limbs of

Figure 2
Incisions of the different transorbital approaches, shown on a left eye. A: Superior route (red) and transcutaneous lateral route (orange); B: Lateral retrocanthal route (transconjunctival); C: Medial precaruncular route; D: Inferior transconjunctival route.



the medial canthal tendon, between which the lacrimal sac is located—the site where the superior and inferior lacrimal canaliculi drain after coursing along the superior and inferior eyelid tarsi, respectively. Accordingly, the precaruncular incision is preferred over the transcaruncular approach. The most suitable dissection plane is immediately posterior to the posterior limb of the medial canthal tendon; this keeps the entire lacrimal system superficial to the dissection plane, minimizing the risk of iatrogenic injury and subsequent postoperative epiphora. Placing lacrimal probes prior to surgery can also help prevent injury to the lacrimal apparatus, allowing the lacrimal pathways to be identified and protected and reducing the risk of inadvertent transection.[1-3]

The initial incision should be made in the conjunctiva, anterior to the caruncle and posterior to the skin of the medial canthus (Figure 2C). The incision is then extended superiorly and inferiorly along the superior and inferior extensions of the posterior limb of the medial canthal tendon, and dissection should proceed medially in the plane immediately posterior to these structures. Dissection should continue until the posterior lacrimal crest is reached, immediately posterior to which an incision should be made in the periosteum. With malleable retractors, the periosteum and remaining orbital contents should be retracted laterally, and dissection should proceed posteriorly in the plane between the periosteum and cribriform plate of the ethmoid bone until the optic nerve or the desired anatomical target is reached. During this step, at the junction between the lamina papyracea and skull base, the ethmoidal arteries (anterior, posterior, and, in some cases, middle) are identified; they should be preserved whenever possible but can be cauterized and transected if required. In cases in which the lamina papyracea is fractured, it needs to be repaired only if a major change in the orbital volume is expected (causing diplopia or enophthalmos) or if there is herniation of the medial rectus muscle through the defect. At the end of the procedure, a layered closure should be performed; conjunctival closure is not always necessary but should be performed if there is significant caruncular edema.[1-4]

Although the medial orbit is more frequently accessed via the endoscopic endonasal route, the transorbital approach is particularly relevant in the setting of tumors, especially when integrated into combined strategies. Initiating dissection via the transorbital route allows key intraorbital and intracranial neurovascular structures to be identified and protected without the need to advance through the sinonasal tumor mass, facilitating tumor resection and reducing surgical risk, especially when the boundaries between the lesion and critical structures are not well defined.[1,2] The medial transorbital approach can also be extended superiorly, always preserving the levator palpebrae aponeurosis, or inferiorly, through an extension of the conjunctival incision along the inferior fornix—as described in the inferior approach.[2]

Inferior Approach

The anterior boundaries of the inferior orbital quadrant are the insertion of the inferior oblique muscle (medially) and the lateral limit of the orbital floor (laterally), and the posterior boundaries are the optic nerve (medially) and inferior orbital fissure (laterally). As in the medial approach, if required, insertion of the inferior oblique muscle can be retracted (in this case superiorly) together with the periosteum to improve surgical exposure and access.[1-3]

The inferior approach is usually conducted through a transconjunctival incision at the inferior fornix, which is preferred over transcutaneous approaches (subciliary or subtarsal) owing to the absence of a visible skin scar, a lower risk of eyelid ectropion, and the possibility of extending the approach to the medial and lateral regions of the orbit via the precaruncular and retrocanthal routes, respectively. The approach begins with an incision in the conjunctiva parallel to the lower eyelid margin, approximately 3–4 mm below the tarsal plate—a lower blepharoplasty incision (Figure 2D). The orbicularis oculi muscle is then transectioned, and dissection proceeds inferiorly along the preseptal plane—as in the superior approach, to avoid herniation of orbital fat into the operative field—toward the inferior orbital rim. Next, a horizontal suture is placed from the cephalic portion of the conjunctival flap to the upper eyelid margin, allowing the flap to be retracted superiorly. An incision is then made in the periosteum at the posterior aspect of the inferior orbital rim, allowing the dissection to advance posteriorly toward the desired anatomical target, always following the subperiosteal plane of the orbital floor with the aid of malleable retractors. During this stage, it is essential to identify and preserve the infraorbital nerve, which may be found within an intraosseous canal or adherent to the bony bed of the orbital floor. At the posterior limit of dissection via the inferior route, the inferior orbital fissure can be identified; its contents can be transected if required, unlike those of the superior orbital fissure. If the surgical procedure results in a significant bony defect of the orbital floor, with a potential impact on the orbital volume and consequent risk of diplopia, it should be reconstructed, usually with a titanium implant. At the end of the procedure, a layered closure should be performed, although conjunctival closure is not always necessary.[1-4]

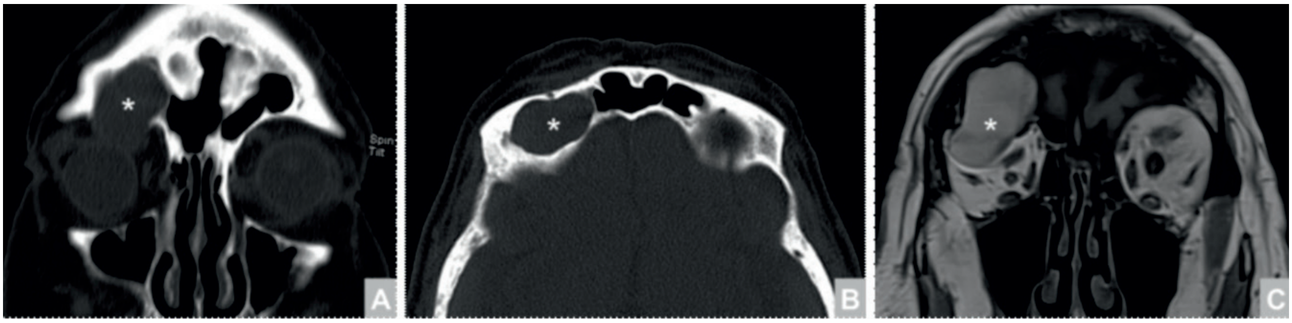
The inferior transorbital route can be particularly useful for managing tumors involving the orbital floor or adjacent structures, especially in cases requiring maxillectomy, since it allows excellent visualization and control of tumor resection. Additionally, this route provides access to the infraorbital nerve and the inferior orbital fissure, as these structures are important potential routes for neoplastic spread.[1,2]

Case Presentations

Case 1. Superior Transorbital Approach

An 82-year-old man was referred by the ophthalmology department to the otolaryngology clinic with a several-year history of right eye proptosis, without associated diplopia, restricted ocular motility, or visual changes. Computed tomography (CT) revealed an expansile lesion measuring 38.9 mm in the coronal plane located in the right frontal sinus, compatible with a mucocele, with erosion of the orbital roof (displacing the globe anteroinferiorly and producing proptosis) and erosion of the posterior wall of the frontal sinus, although without intracranial extension (Figure 3). Surgical treatment was recommended, with drainage of the frontal mucocele via the superior transorbital route—with intraoperative neuronavigation assistance—in combination with a right-sided endoscopic endonasal approach (maxillary sinusotomy, anterior ethmoidectomy, and Draf IIA frontal sinusotomy). Figure 4 shows some of the surgical steps of the transorbital approach as well as the clinical appearance 2 weeks after surgery. After the procedure, the patient reported hypoesthesia of the right frontal region, which was decreasing by the second postoperative week.

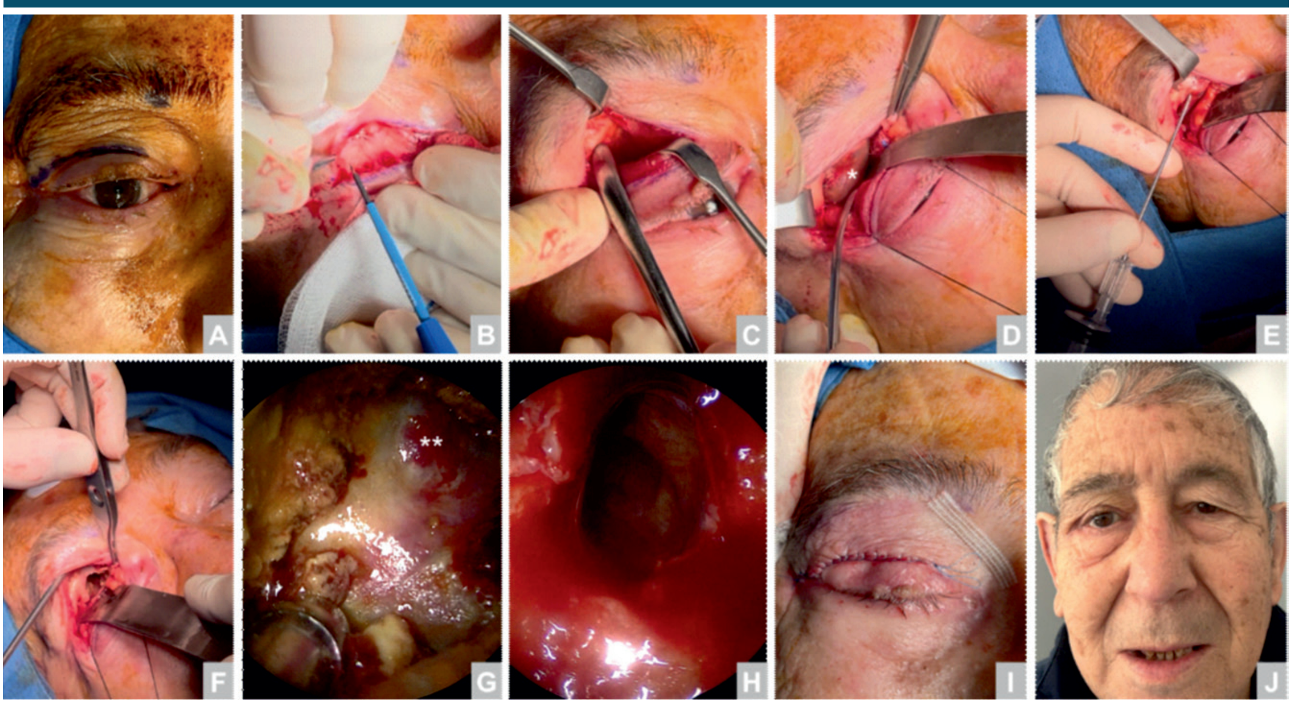
Figure 3
Preoperative imaging studies: coronal section (A) and axial section (B) on computed tomography, and coronal T1-weighted magnetic resonance image (C). In all three images, the mucocele is marked with *.



Case 2. Lateral Transorbital Approach

A 69-year-old woman with a 2-year history of Graves' disease (managed with methimazole 5 mg three times daily) was referred by neuro-ophthalmology to the otolaryngology clinic for urgent orbital decompression. The patient presented with thyroid eye disease complicated by rapidly progressive bilateral optic neuropathy, which was more pronounced on the right. Clinical examination revealed a right relative afferent pupillary defect, visual acuity of 6/10 in the right eye and 8/10 in the left eye, and right-predominant exposure keratitis. The patient also had bilateral proptosis and eyelid edema that was worse in the mornings, with some degree of horizontal diplopia. Orbital CT revealed "[...] marked bilateral proptosis [...] significant

Figure 4
Surgical and postoperative photographs. A: Marking of the incision line in an upper eyelid crease; B: Identification and dissection in the preseptal plane; C: Posterior dissection after incision of the periosteum at the superior orbital rim; D: Identification of the mucocele (*) in the superior orbital wall; E: Aspiration of the mucocele contents with a 14-gauge (14G) Abocath intravenous catheter; F: Excision of the mucocele "pseudocapsule"; G: Endoscopic image of the mucocele cavity, showing the dura mater of the frontal lobe (**); H: Endoscopic image of the surgically created communication between the mucocele cavity and frontal sinus; I: Skin closure with 6-0 nylon; J: Clinical appearance 2 weeks after surgery.



thickening of the extraocular muscles [...]" (Figure 5). Balanced decompression of the right orbit was therefore recommended: endoscopic endonasal surgery to decompress the medial orbital wall, and a transcutaneous lateral transorbital approach to decompress the lateral wall. The latter involved removal of the upper third of the lateral wall of the right orbit over a 2 × 2 cm area until the temporal fascia was visualized, followed by incisions in the periorbita, exposing the orbital fat. Figure 6 shows the orbital CT performed 8 months after the surgical procedure, demonstrating "[...] partial removal of the frontal process of the right zygomatic bone [...] slightly less proptosis on the right when compared with the previous study [...] greater patency of the right orbital apex [...]". Balanced decompression of the left orbit was subsequently recommended, and the patient underwent the procedure approximately 1 year after the right-sided intervention. The procedure followed a protocol similar to the one described above and was uneventful. Since then, gradual improvement in bilateral visual acuity has been observed (to 8/10 in the right eye and 9/10 in the left eye 2 years after the second procedure) as well as an improvement in diplopia.

Case 3. Inferior Transorbital Approach

An 8-year-old boy presented with a 5-day history of fever, purulent rhinorrhea, and left maxillary dental pain. He had been receiving amoxicillin-clavulanate for 48 hours for a suspected

Figure 5
Preoperative orbital computed tomography, coronal (A) and axial (B) sections

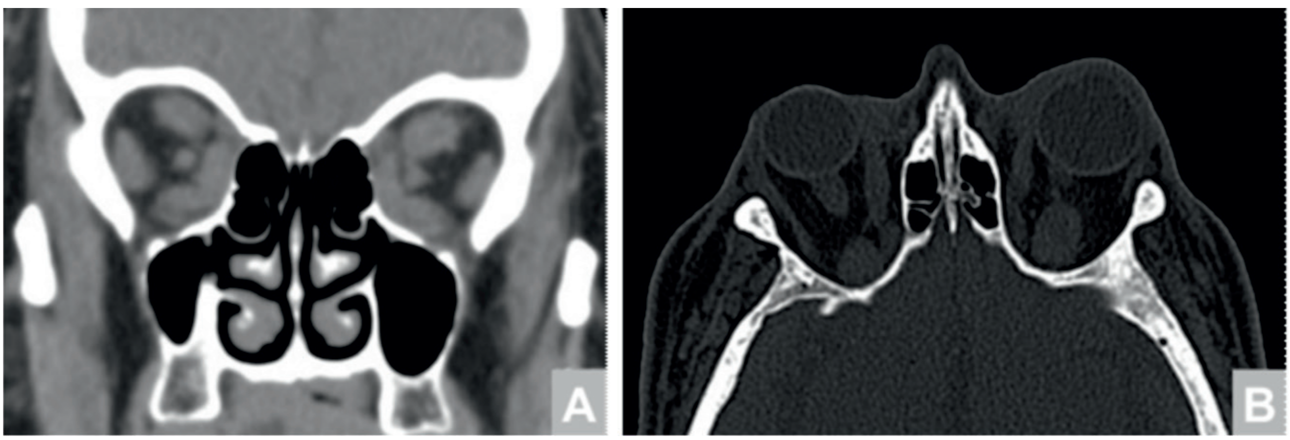
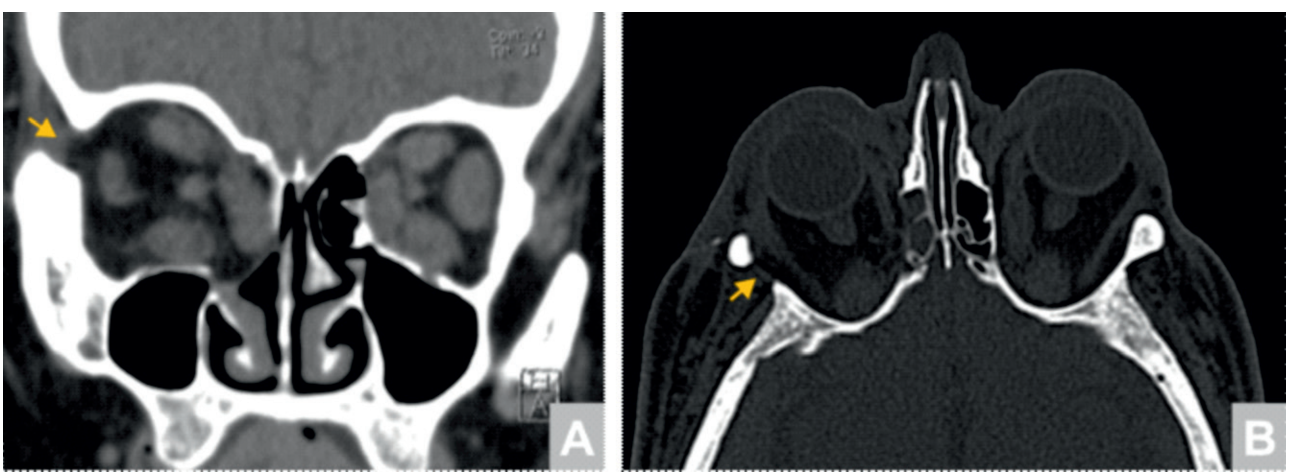
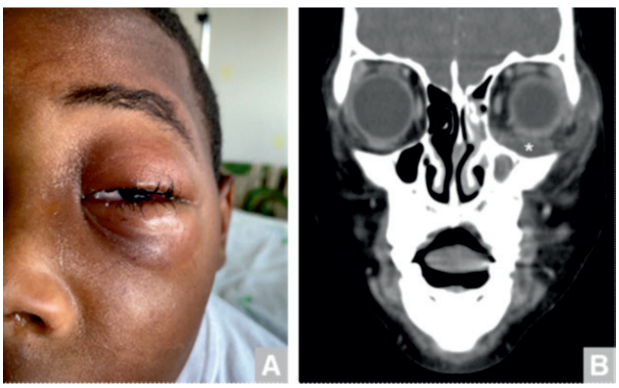


Figure 6
Orbital computed tomography after surgical decompression of the right orbit, coronal (A) and axial (B) sections. The zygomatic bone defect created during surgery is marked with an orange arrow



dental abscess, with no significant clinical improvement. Physical examination showed edema and erythema of the left periorbital region, resulting in restricted ocular motility and limited eye opening, with preserved visual acuity on ophthalmologic evaluation (Figure 7A). CT of the paranasal sinuses revealed left maxillary and ethmoid sinusitis as well as an intraorbital abscess measuring 8 mm at its largest diameter, located on the inferior orbital wall in an extraconal location (Figure 7B). Because there was no clinical improvement despite intravenous antibiotic therapy with ceftriaxone and clindamycin, surgery was recommended. The procedure conducted was a combined technique: endoscopic endonasal surgery (left maxillary sinusotomy and anterior ethmoidectomy) and an inferior transorbital approach via the transconjunctival route for drainage of the orbital abscess, which was found to be subperiosteal. Figure 8 shows some of the surgical steps of the transorbital approach as well as the clinical appearance on postoperative day 7, at which point the patient had recovered full ocular motility.

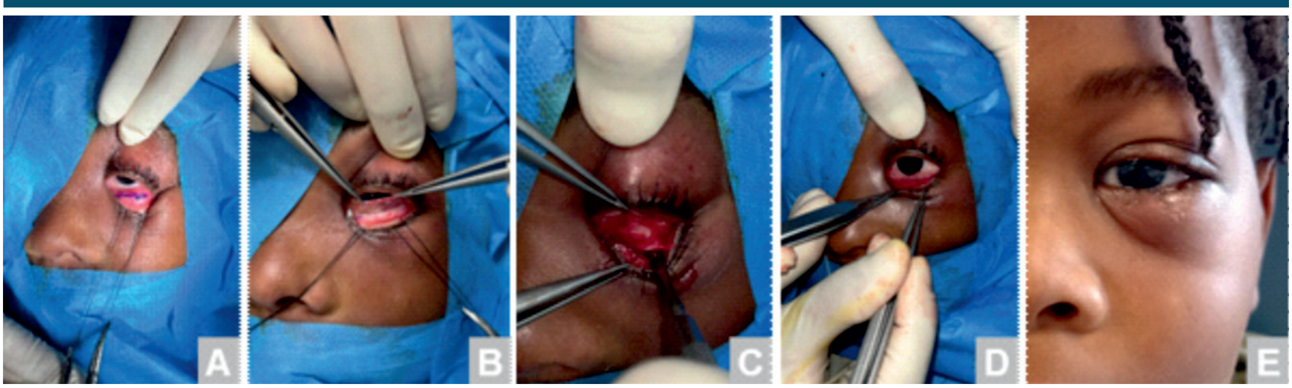
Figure 7
Preoperative photographs and imaging, showing the clinical appearance of the left periorbital region (A) and a coronal computed tomography section of the paranasal sinuses, with * marking the abscess in an extraconal location on the inferior orbital wall (B).



Conclusion

In conclusion, transorbital surgical approaches are increasingly important in the management of orbital, periorbital, and skull base diseases, because they provide access to deep and complex anatomical regions through minimally invasive, effective, and safe surgical routes. Their versatility – whether used in isolation or in combination with other endoscopic routes or with traditional approaches (such as craniotomies) – together with their minimal functional and aesthetic impact, makes these approaches an increasingly valuable option in clinical practice. To optimize the surgical results and minimize complications with these techniques, adequate patient selection, detailed knowledge of the orbital anatomy, and a multidisciplinary approach to each case are crucial. These clinical cases illustrate that transorbital surgical approaches are a valuable addition to the otolaryngologist's surgical armamentarium and are establishing

Figure 8
Surgical and postoperative photographs. A: Marking of the incision line below the tarsal plate; B: Blunt dissection in the preseptal plane down to the inferior orbital rim; C: After suturing of the conjunctival flap to the upper eyelid, exploration of the cavity in the subperiosteal space, with drainage of purulent material; D: Closure of the incision with 9-0 Vicryl; E: Result on postoperative day 7, with complete recovery of ocular motility



themselves as a distinctive technique that is gaining ground in the specialty's clinical practice.

Conflicts of Interest

The authors declare that there is no conflict of interests regarding the publication of this paper.

Data Confidentiality

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

Protection of humans and animals

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the 2013 Helsinki Declaration of the World Medical Association.

Privacy policy, informed consent and Ethics Committee Authorization

The authors declare that they have written consent for the use of photographs of patients in this article.

Funding Sources

This work did not receive any contribution, funding or scholarship.

Availability of scientific data

There are no datasets available, publicly related to this work.

Declaration of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this work, the authors used ChatGPT® for spelling and grammar review, as well as to improve the fluency of the text. After using this tool, the authors reviewed and edited the content as necessary and take full responsibility for the content of the publication.

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