Oculoplasty Symposium: Current Perspectives in Globe Ablation Procedures

Evisceration: When is it a necessity?

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ABSTRACT

Introduction: Evisceration is the removal of intraocular contents while preserving the scleral shell and attachments, enabling a more natural coupling between the orbital implant and prosthesis. As the balance between necessity and preference shifts, it is essential to identify when evisceration is the appropriate procedure to prevent unnecessary tissue removal. This review examines evisceration in contemporary practice, with emphasis on when it becomes a necessity rather than a choice.

Methods: A structured narrative review of the literature on indications, contraindications, surgical techniques, orbital implants, complications, and postoperative rehabilitation regarding evisceration was conducted, searching PubMed, Scopus, and Google Scholar from database inception to 31 May 2025.

Findings: Evisceration is primarily indicated or necessary in eyes that are irreversibly blind and painful due to chronic disease or infection. The potential for residual infection within the scleral envelope, the theoretical risk of occult intraocular malignancy, severe scleral thinning, or rupture extending posteriorly may preclude evisceration in selected cases. Factors such as the underlying pathology, the patient's systemic condition, and the desired aesthetic outcome play an integral role in decision-making. The introduction of the scleral wall modifications has enhanced implant sizing, orbital volume restoration, and symmetry. Thus, establishing evisceration as a reconstructive operation capable of achieving good cosmetic and functional outcomes in severely traumatised, phthisical, or anterior staphylomatous eyes.

Conclusion: Evisceration is not only a less invasive alternative to enucleation, but also a reconstructive procedure with specific indications. Careful case selection, ethical counselling, optimal surgical technique, and postoperative rehabilitation remain central to successful patient outcomes.

INTRODUCTION

Evisceration is defined as the removal of intraocular contents while preserving the scleral shell and extraocular muscle attachments. It remains a time-tested surgical procedure in ophthalmic practice. First described in 1817 by Beer,[1] evisceration was initially performed to manage devastating intraocular infections and painful blind eyes when enucleation carried substantial surgical morbidity. A major advancement came in 1885, when Mules introduced the placement of a glass sphere within the eviscerated sclera, marking the beginning of modern orbital implantation.[2, 3] This modification not only improved cosmesis but also restored orbital volume, revolutionising the role of evisceration from a purely ablative procedure to reconstructive surgery. Over time, refinements in aseptic technique, anaesthetic safety, and ocular implant technology have transformed evisceration from a last-resort intervention to a reconstructive procedure capable of achieving good cosmetic and functional outcomes.

The historical reluctance toward evisceration was primarily because of the fear of sympathetic ophthalmia, a bilateral granulomatous panuveitis that may follow ocular trauma or surgery.[3, 4, 5] Incomplete removal of uveal tissue was believed to predispose to this vision-threatening immune reaction. Consequently, enucleation, complete removal of the globe including the sclera, became the preferred approach in many settings.[6] However, studies published from the early 2000s onwards have substantially revised this perspective. Multiple series have demonstrated that the risk of sympathetic ophthalmia after evisceration is exceedingly rare, particularly when meticulous surgical technique is employed to ensure complete removal of uveal remnants.[7, 8, 9] Furthermore, with modern immunosuppressive therapy, even the occasional case of sympathetic ophthalmia can be effectively managed without permanent loss of vision in the fellow eye.[10]

Alongside the improved safety profile, advances in orbital implant design have improved prosthesis motility and achieved superior cosmetic rehabilitation.[11] Retaining the native scleral shell preserves the extraocular muscle cone and orbital architecture, enabling more natural coupling between the implant and prosthesis. This anatomic preservation translates to reduced operation time, smoother postoperative recovery, and a lower risk of socket contracture compared to enucleation.

Despite these advantages, evisceration is not without limitations.[12, 13] The potential for residual infection within the scleral envelope, the theoretical risk of occult intraocular malignancy, and the presence of severe scleral thinning or rupture extending posteriorly may preclude the procedure in selected cases. Therefore, proper patient selection remains critical.

In recent decades, the scope of evisceration has expanded beyond its traditional indications. It is now routinely employed in infectious endophthalmitis or panophthalmitis, provided the sclera remains sufficiently intact to contain an implant.[13, 14] The technique has also become a viable option for cosmetic rehabilitation of disfigured, phthisical, or anterior staphylomatous eyes, particularly for individuals seeking rapid recovery and minimal postoperative morbidity. In contrast, enucleation remains reserved for cases in which intraocular malignancy is suspected or confirmed, or when scleral integrity is severely compromised.[15] As the boundaries between necessity and preference evolve, it is important to critically evaluate when evisceration is the most appropriate procedure, ensuring that no more of the diseased eye is removed than is absolutely necessary. Factors such as the underlying pathology, the patient's systemic condition, and the desired aesthetic outcome play an integral role in decision-making. This review article revisits the indications, advantages, limitations, and technical considerations of evisceration in contemporary practice, highlighting the clinical scenarios in which the procedure represents the most appropriate and necessary intervention.

METHODS

This narrative review of the literature was conducted by searching PubMed, Scopus, and Google Scholar for articles published from database inception to 31 May 2025, using keywords including "evisceration," "eye evisceration," "enucleation," "orbital implant," "anophthalmic socket," "sympathetic ophthalmia," "blind painful eye," "endophthalmitis," "panophthalmitis," "ocular trauma," "phthisis bulbi", and "anterior staphyloma". Reference lists of relevant articles were also manually screened to identify additional historical and clinically important publications. Priority was given to peer-reviewed English-language original clinical studies, review articles, and surgical technique reports. Articles were excluded if they were not relevant to ophthalmic evisceration, lacked clinically applicable information, or addressed anophthalmic socket management without specific discussion of evisceration. The selected literature was reviewed narratively and grouped into major themes: indications for evisceration; contraindications and case selection;

comparison with enucleation; surgical technique; scleral wall modification techniques; orbital implant selection; complications; postoperative rehabilitation; and ethical considerations. Because this was a narrative review rather than a meta-analysis, formal risk-of-bias assessment and quantitative pooling of outcomes were not performed.

FINDINGS AND DISCUSSION

Indications for Evisceration

Evisceration is primarily indicated or necessary in eyes that are irreversibly blind and painful from chronic disease or infection, provided there is no suspicion of intraocular malignancy and the scleral shell remains structurally intact.[15] The decision to proceed with evisceration should be guided by the underlying pathology, the patient's systemic condition, and the anticipated cosmetic and psychological outcomes. In contemporary ophthalmic practice, the most common indications can be grouped into four major categories: blind painful eyes, severe ocular trauma, uncontrolled intraocular infection, and cosmetic rehabilitation.[11, 15]

1. Blind Painful Eye

   The blind painful eye represents an important indication for evisceration.[16] These eyes typically result from chronic end-stage diseases such as neovascular glaucoma, chronic uveitis, or end-stage retinal disorders. Pain in such cases may stem from ciliary body inflammation, corneal decompensation, or secondary angle-closure glaucoma, which can be refractory to medical therapy. When topical cycloplegics, corticosteroids, and intraocular pressure-lowering agents fail to relieve discomfort, evisceration offers definitive palliation and early cosmetic rehabilitation.[17]

   Prior to surgery, it is important to rule out occult intraocular malignancy, particularly in eyes with opaque media or long-standing phthisis. B-scan ultrasonography remains the investigation of choice for this purpose. In certain cases, a second specialist opinion may be advisable before definitive surgery, both for medicolegal prudence and patient reassurance.

2. Severe Ocular Trauma

   Evisceration is also indicated in severe ocular trauma when the scleral shell is intact, but the intraocular contents are irreparably damaged. Examples include open-globe injuries with extensive intraocular tissue loss, disorganisation of intraocular structures, or penetrating injuries with no visual potential.[18] In such cases, evisceration allows removal of necrotic intraocular tissue, reduces the inflammatory and infectious load, and enables immediate orbital implant placement without the extensive dissection required for enucleation.[19] Furthermore, in ocular trauma, the timing of surgery is critical. When performed early, evisceration minimises the risk of socket contracture and yields better cosmetic outcomes than delayed secondary procedures.

3. Uncontrolled Intraocular Infection

   Another well-established indication for evisceration is severe endophthalmitis or panophthalmitis unresponsive to medical therapy.[20] In the modern era, evisceration is largely preferred to enucleation for infectious cases, provided that the scleral wall remains viable.[19, 20] Evisceration offers faster infection control by allowing the debridement of infected tissues and direct irrigation of the scleral cavity with antibiotics. In addition, retaining the scleral shell facilitates early prosthetic rehabilitation once the infection resolves.[21]

   In cases of globe perforation due to panophthalmitis, evisceration can be performed after confirming that the scleral rupture does not extend posteriorly.[13,22] If extensive posterior involvement of scleral rupture or scleral necrosis is present, enucleation remains the safer alternative. The use of adjunctive systemic and topical antibiotics is critical to minimise postoperative recurrence of infection.

4. Cosmetic Rehabilitation

   Evisceration serves an important reconstructive role in patients seeking cosmetic rehabilitation of disfigured, nonseeing eyes.[23] Conditions such as phthisis bulbi, anterior staphyloma, and post-inflammatory atrophic eyes can cause significant psychosocial distress despite being painless. In such cases, evisceration with orbital implant placement provides superior prosthesis motility, improved symmetry, and greater patient satisfaction compared with enucleation.[19, 24] From a reconstructive perspective, preserving the scleral shell maintains orbital volume and muscle cone alignment, which directly translates to natural prosthetic movement. In particular, patients with anterior staphyloma benefit from evisceration because the intact posterior sclera provides a firm base for implant placement while eliminating the disfiguring anterior bulge.[24, 25]

Advantages and disadvantages of Evisceration

A comparison of the pros and cons of evisceration is presented in Table 1.

Advantages of Evisceration	Disadvantages / Risks of Evisceration
Shorter surgical time and faster postoperative recovery compared to enucleation.[7,24]	The residual scleral shell may harbour infection or necrotic tissue in infectious or traumatic cases.[13,20]
Better postoperative prosthesis motility and cosmesis due to preservation of extraocular muscles and scleral shell.[11,12]	Not suitable when intraocular malignancy is suspected or scleral rupture extends posteriorly.[14,24]
Allows placement of large orbital implants, improving orbital volume replacement and facial symmetry.[21,23]	Theoretical risk of sympathetic ophthalmia due to residual uveal tissue (extremely rare in modern series).[3,9]
Less intraoperative bleeding and simpler surgical technique. Can be performed under local anaesthesia.[7,8]	Limited access to the posterior orbit in case of unexpected hidden pathology or retained foreign body[18]
Lower rate of socket contraction and implant extrusion compared with enucleation.[8,21]	Residual scleral necrosis or incomplete debridement may predispose to reinfection.[20]
Preserves normal orbital anatomy and alignment of the muscle cone, improving prosthesis movement.[11,23]	Limited reconstructive potential in cases of severe phthisis or shrunken scleral shell.[14]
Reduced emotional trauma, as preservation of part of the natural eye improves patient acceptance.[24]	Patient anxiety regarding theoretical sympathetic ophthalmia risk or need for long-term prosthetic care.[3]

Surgical Technique and Perioperative Considerations

Pre-operative Care

Meticulous preoperative evaluation is important to achieve both functional and cosmetic success after evisceration. A thorough medical and ocular history should include details regarding systemic comorbidities, current medications, particularly antiplatelet or anticoagulant therapy, and any prior ocular surgery. Patients on antiplatelet or anticoagulant therapy should ideally discontinue such drugs 5-7 days before surgery, when permissible, to minimise intraoperative bleeding.[26] A complete ocular examination of both the affected and the fellow eye is mandatory.[27] This would help rule out potentially treatable causes of pain, assess for co-morbid conditions, and confirm the absence of intraocular malignancy.

When the media is opaque and direct visualisation of intraocular contents is not possible, B-scan ultrasonography must be performed to exclude intraocular mass lesions.[28] In longstanding phthisical eyes, where a tumour may be concealed, ultrasound biomicroscopy or magnetic resonance imaging can be considered. A second specialist opinion is advisable when diagnostic uncertainty persists.

Patients should receive detailed counselling about the procedure, its cosmetic expectations, potential complications, and the rare possibility of sympathetic ophthalmia. Preoperative photography helps document the appearance of the eye at presentation, including pre-existing deformity (Figures 1a and 2a).

Anaesthesia and Surgical Preparation

Evisceration can be performed under local or general anaesthesia,[16] depending on the patient's age, systemic status, and psychological tolerance. Local or peribulbar anaesthesia with intravenous sedation is sufficient for most adults, offering safety and rapid recovery. General anaesthesia is reserved for children, uncooperative adults, or extensive trauma cases requiring prolonged manipulation. Following anaesthesia, 5-10% povidone iodine is applied to the cornea, conjunctival sac, and periocular skin for a minimum of three minutes prior to surgery,[29] and a sterile drape is applied. A lid speculum is used to expose the surgical field.

Evisceration Techniques

Standard evisceration techniques involve gaining access to the anterior chamber and removing the intraocular contents.[30] A 360-degree conjunctival peritomy is performed just posterior to the limbus using scissors, and Tenon's capsule is dissected posteriorly to expose the sclera circumferentially. The extraocular muscle insertions are preserved to maintain postoperative motility. A corneal stab incision is made at the limbus using a scalpel blade. This incision is extended 360 degrees with scissors to excise the cornea button (Evisceration with keratectomy).[30] This provides direct access to the intraocular cavity while maintaining the strength of the peripheral scleral rim for closure. In selected cases, the surgeon may choose to preserve the cornea if there are no contraindications, such as keratitis, corneal thinning, corneal ulcers or corneal degeneration (Evisceration with retention of the cornea).[30] Instead of cornea removal, a 180-degree sclerotomy is performed at the 12 o'clock position, between the insertion of the superior rectus muscle and the limbus. All intraocular contents, including the uveal tissue, retina, and vitreous, are gently removed using an evisceration spoon or Freer's periosteal elevator with or without a cotton applicator. In infectious cases, the cavity should be irrigated with balanced salt solution containing antibiotics. The surgeon may wipe the inner scleral surface with absolute alcohol to ensure devitalization of residual uveal tissue.[32] Meticulous removal of all pigmented tissue minimises the already rare risk of sympathetic ophthalmia and reduces the chance of postoperative inflammation.[22, 24]

Scleral Wall Modifications

To accommodate an adequately sized orbital implant, posterior scleral expansion is achieved through splitting the scleral cavity and releasing the scleral flaps or petals from their optic nerve attachments.[32] These scleral modifications or petal techniques differ in the number and orientation of relaxing incisions. The goal is to increase scleral compliance while preserving vascularity and providing uniform closure around the implant.

1. Posterior Sclerotomy Technique
Long et al.,[31] illustrated a scleral modification technique where the scleral cavity is opened posteriorly. A vertical posterior sclerotomy positioned temporal to the optic nerve allows access to the optic nerve. The implant is inserted behind the sclera, within the muscle cone, using an implant introducer. The scleral flaps are then sutured in two layers over the implant, preventing migration, erosion, and extrusion.

2. Two-Petal (Bisection) Technique
Massry et al.,[32] described this method for modifying the sclera to accommodate a larger implant post-evisceration while reducing the risk of postoperative enophthalmos and superior sulcus deformity. A full-thickness sclerotomy is made from the limbal incision to the optic nerve in the inferonasal and superotemporal quadrants between the rectus muscle insertions, creating two scleral flaps. The scleral flaps are detached from the optic nerve, mobilised and brought forward. The orbital implant is then placed within the scleral flaps or petals, which are folded over the implant and closed down to the equator.

3. Four-Petal (Quadrisection) Technique
In this technique, four oblique sclerotomies are created between the rectus muscle insertions, forming four posteriorly hinged petals. Each petal retains thickness and an independent vascular supply, decreasing the risk of scleral necrosis. The quadrisection technique offers good orbital volume restoration, even closure tension, minimal implant extrusion, and optimal prosthesis motility.[33, 34, 35, 36]

Orbital Implantation and Wound Closure
Implant material is selected based on indication and infection status. Non-porous acrylic or silicone implants are recommended for infectious or inflamed sockets due to their smooth surface and reduced bacterial adherence.[23, 25] Porous implants such as hydroxyapatite or porous polyethylene (Medpor) may be used in sterile cases to improve fibrovascular ingrowth and prosthesis motility.[25, 37, 38, 39]

The implant size is chosen to restore orbital volume while permitting tension-free closure.[40] The implant is inserted into the posterior scleral cavity using an implant introducer. In petal techniques, the petals are temporarily retracted to accommodate the implant centrally, ensuring even distribution of closure forces.

The scleral petals are re-approximated with interrupted 5-0 or 6-0 vicryl sutures.[41] Watertight but non-ischemic closure prevents postoperative implant exposure. Even closure of multiple petals is key to maintaining implant centration and symmetry, an inherent advantage of the two- and four-petal designs.[25, 34, 36]

Tenon's capsule is re-approximated with interrupted 5-0 or 6-0 absorbable sutures, and the conjunctiva is closed with 6-0 absorbable sutures in a continuous or interrupted pattern.[30, 32] Layered closure provides smooth coverage over the implant and maintains fornix depth for prosthesis fitting (Figure 1b). The risk of socket dehiscence is minimised when the sclera has been evenly expanded and closed under minimal tension. A fenestrated conformer coated with antibiotic ointment (tobramycin or chloramphenicol) is placed in the fornices to preserve the socket contour. A temporary tarsorrhaphy may be performed in paediatric or infected eyes to retain the conformer.[42] A firm pressure dressing is applied to control oedema and prevent hematoma formation.

Post-operative Care
Following evisceration, the goals of postoperative care are to ensure infection control, pain relief, and proper wound healing, while maintaining the shape of the newly formed socket. A pressure dressing applied at the end of surgery should remain undisturbed

for 48-72 hours unless there is excessive discomfort or soakage. The pressure dressing minimises the risk of hematoma and conjunctival oedema, both of which can jeopardise wound healing and implant stability. Typically, topical broad-spectrum antibiotic-steroid drops or ointments are continued four times daily for 2-3 weeks to reduce inflammation and promote epithelialization.[39] Analgesic and anti-inflammatory medications ensure patient comfort and reduce eyelid oedema. Mild chemosis can be managed conservatively with topical lubricants and steroid drops, while frank wound dehiscence or implant visibility requires prompt intervention. The conformer inserted intraoperatively maintains fornix depth and prevents socket contracture (Figure 2b). It should remain in situ for 4-6 weeks, being periodically lubricated with artificial tears or antibiotic ointment. If discharge or mucopurulent secretion develops, the conformer may be gently removed, cleaned with saline, and replaced under sterile precautions.

Fitting a custom-made ocular prosthesis is a crucial milestone in postoperative rehabilitation (Figure 1c and 1d). In uncomplicated cases, prosthesis fitting is typically done 4-6 weeks postoperatively, once conjunctival oedema subsides, and the socket is well epithelialised.[19, 23, 25, 33, 38] Early prosthetic fitting improves appearance and prevents socket contracture and fornix shortening, especially in paediatric patients (Figure 2c and 2d). Custom-made prostheses are preferred over stock shells due to their superior cosmetic match, improved motility, and better fit.[25, 43] The prosthesis should be periodically polished and replaced to maintain optimal sheen and prevent protein deposition.

Ethical Considerations

The psychological impact of eye loss can be profound, even when the preoperative eye was blind and disfigured.[24] Counselling, reassurance, and referral to ocularists or rehabilitation specialists are integral to postoperative recovery. Informed consent for eye removal is essential. Patients should be clearly counselled about the indication, possible alternatives such as enucleation or conservative management, and the expected cosmetic and functional outcomes. Although the risk of sympathetic ophthalmia after evisceration is exceedingly low, it must still be disclosed transparently. Proper documentation of the consent process, surgical indication, implant details, and follow-up safeguards both the patient and surgeon. In essence, ethical evisceration practice involves more than technical skill; it involves respect for patient dignity, informed participation, and continued support throughout recovery and rehabilitation.

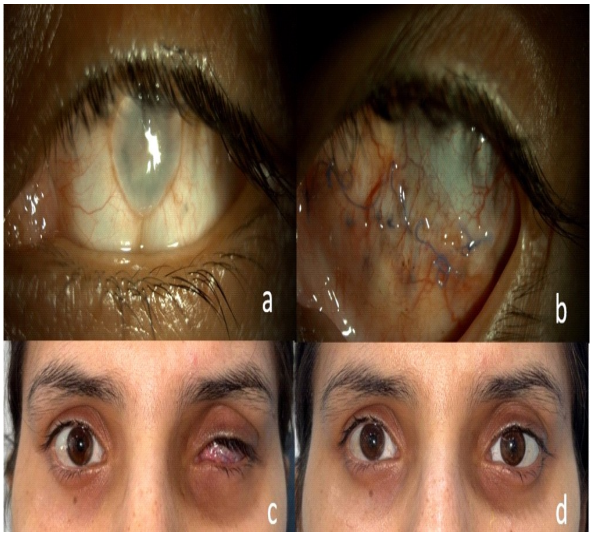

Figure 1 (a-d). Clinical photographs showing a 25-year-old female with left fungal endophthalmitis who had evisceration with orbital implantation and prosthetic rehabilitation.

(a) Preoperative slit-lamp photograph showing a phthisical eye post-fungal endophthalmitis. (b) Clinical photograph at three weeks post-evisceration plus orbital implant placement, showing healing conjunctiva with sutures in situ. (c) Postoperative appearance before prosthetic fitting, showing the anophthalmic socket and socket asymmetry. (d) Final postoperative appearance after customised ocular prosthesis fitting, showing improved palpebral aperture and satisfactory socket symmetry.

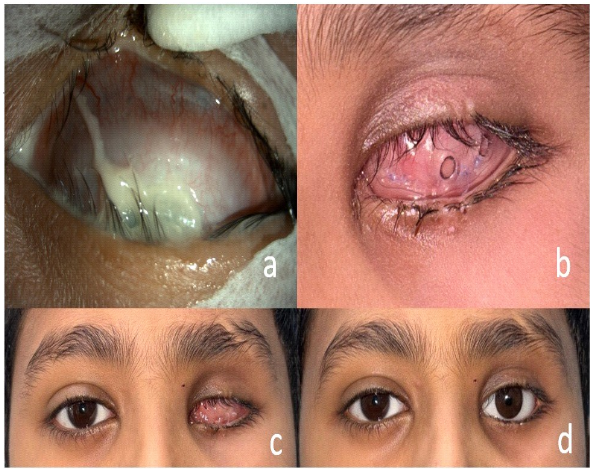

Figure 2 (a-d). Clinical photographs of a 12-year-old boy with a left perforated anterior staphyloma and secondary infection who had evisceration with orbital implantation and prosthetic rehabilitation.

(a) Preoperative clinical photograph of a disfigured eye with perforated anterior staphyloma and secondary infection. (b) Clinical photograph at five weeks post-evisceration plus orbital implant placement, showing a healed conjunctiva with conformer in situ. (c) Postoperative appearance before prosthetic fitting, showing the anophthalmic socket and socket asymmetry. (d) Final postoperative appearance after customised ocular prosthesis fitting, showing improved palpebral aperture and satisfactory socket symmetry.

CONCLUSION

Evisceration is primarily indicated or necessary in eyes that are irreversibly blind and painful from chronic disease or infection, provided there is no suspicion of intraocular malignancy and the scleral shell remains structurally intact. The introduction of the scleral-petal modification has enhanced implant sizing, orbital volume restoration, and symmetry, establishing evisceration as a refined reconstructive operation capable of achieving good cosmetic, functional, and psychological outcomes in patients with blind severely traumatised or disfigured eyes. Its safety has been reaffirmed by modern evidence showing an extremely low risk of sympathetic ophthalmia, provided meticulous uveal removal is done. Nevertheless, careful case selection, ethical counselling, and postoperative rehabilitation remain central to successful patient outcomes.

Informed consent: Written informed consent was obtained for the use of clinical photographs.

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