Strategies in Pterygium Treatment

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Pterygium is a conjunctival degenerative process characterized by a sheet of fibrovascular tissue encroaching upon the cornea within the inter-palpebral fissure, almost invariably on the nasal side. Excessive exposure to ultraviolet sunlight is the most common predisposing factor. Ultraviolet light induced damage to limbal stem cell barrier with subsequent conjunctivalization of the cornea is the current accepted etiology. Other agents that give rise to chronic irritation of the conjunctiva such as air pollution, dust and wind have also been found as determining factors¹.

Pterygium surgery alone (i.e., bare sclera excision) without the use of adjunctive measures is associated with unacceptably high recurrence rates (30–50 %) and is no longer recommended for the treatment of pterygium. As such pterygium excision is now combined with various adjunctive measures to prevent recurrence of the disease^{2,3}. As we become more proficient in treating pterygium, the goals of surgery should no longer be limited to reducing recurrence and preventing complications, but should also be targeted at achieving a good cosmetic result. Here we will be discussing the various treatment options available and strategies in improving the clinical outcome.

Conjunctival Autograft Surgery

Conjunctival autograft surgery, although more technically demanding, is generally regarded as the procedure of choice for the treatment of primary and recurrent pterygium, because of its efficacy and long term safety.

A free conjunctival graft is harvested from the superior bulbar conjunctiva. We prefer to harvest a thin graft with as little underlying Tenon's as possible. Careful dissection to separate the conjunctival epithelium from the underlying Tenon's is carried out using conjunctival scissors. A blunt

tipped scissors reduces the risk of button-hole of the graft. A thin conjunctival graft has the advantage that it does not contract and produces a more cosmetically acceptable result. The thin graft can be easily smoothed over the scleral bed to cover the entire surgical defect. We recommend over-sizing the graft by about 1 mm so that the wound edges are nicely apposed. This avoids graft retraction or encroachment of the nasal conjunctiva towards the limbus. The graft is then sutured in place over the bare scleral defect with either absorbable or non-absorbable sutures.

Conjunctival autografts are associated with recurrence rates ranging from 2 to 39 % that are comparable to Mitomycin-C and beta-irradiation, but without the attendant risks of sight threatening complications⁴. Although conjunctival autografting is more technically demanding and more time consuming to perform compared to the use of mitomycin-C and beta-irradiation, once the surgical technique is mastered, it is generally considered to be a better option compared to the other treatment modalities because of its proven efficacy and its long safety record.

Use of Fibrin Glue (Tisseel)

Fibrin glue may also be used as an alternative to sutures for securing conjunctival grafts. The use of fibrin glue shortens operating times significantly and is associated with less postoperative discomfort⁵. Fibrin glue also provides a more even attachment of the graft to the scleral bed. However cost remains a major issue. There is currently no clear evidence to show that its use reduces recurrence rates.

Variations in Conjunctival Autograft Surgery

It has been suggested that including limbal stem cells in the conjunctival autograft (limbal-conjunctival graft) may act as a barrier to conjunctival cells migrating on to the corneal surface and help prevent recurrence. The limbal-conjunctival graft includes approximately 0.5 mm of the limbus and peripheral cornea. There is however no

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conclusive evidence regarding the superiority of limbal-conjunctival autografts over conventional conjunctival autografts⁶ and the added risk of limbal damage at the donor site deserves consideration.

Other variations in conjunctival autograft surgery include the use of conjunctival flaps or conjunctival rotation autografts. These techniques may be useful in cases in which it is not possible or desirable to use the superior conjunctiva as a donor source, such as when dealing with extensive Pterygium or patients with glaucoma.

Use of Mitomycin-C

Intra-operative or post-operative mitomycin-C remains the most commonly used medical adjunctive therapies for the prevention of Pterygium recurrence. Several other medical modalities such as 5-fluorouracil and daunorubicin, have also been tried, but these are essentially still experimental.

Mitomycin-C has been shown to be effective in preventing recurrence for primary and recurrent Pterygium. When used intra-operatively, surgical sponges soaked in mitomycin-C solution, are applied directly to the scleral bed following Pterygium excision. The concentration used in most studies range from 0.01% to 0.04% applied for 3 to 5 minutes. When used post-operatively, mitomycin-C eye drops at a dose of 0.005% to 0.04% are often used for 1 to 2 weeks.

Although mitomycin-C has been shown to be an effective treatment for Pterygium and it makes surgery much faster, its use has been associated with serious sight-threatening complications such as scleral necrosis, infectious scleritis, perforation and endophthalmitis⁷.

Beta-Irradiation

It is much less popular because of the inconvenience of arranging its treatment and the long term risk of serious sight-threatening complications such as scleral necrosis, infectious scleritis, corneal perforation and endophthalmitis.

Amniotic Membrane Transplantation

Amniotic membrane transplantation has been recently proved as a treatment option in view of its anti-scarring, anti-angiogenic and anti-inflammatory properties. It also has the advantage that it removes the need for harvesting large autografts, thereby minimizing iatrogenic injury to the rest of the conjunctival surface. However, current comparative studies have demonstrated that amniotic membrane transplant is associated with a higher recurrence rate compare with conjunctival autograft surgery.

CONCLUSION

Pterygium excision combined with conjunctival autograft surgery or mitomycin-C are currently the main methods used for treating Pterygium and reducing its recurrence. However, mitomycin-C should be used judiciously because of the potential long term risk of sight-threatening complications. With these methods, recurrence rates of less than 5% can be achieved.

As we get better at treating Pterygium, our emphasis should no longer be limited to just reducing Pterygium recurrence but we should also aim to ensure a good cosmetic outcome for our patients.

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