

## Conjunctival scarring

<p><b>Aetiology</b></p>	<p>All conjunctival scarring is, by definition, 'cicatricial'; but the term 'cicatrising conjunctivitis' is generally reserved for scarring in which there is significant tissue shrinkage, usually with distortion of the fornices and/or the lids</p> <p>Many conditions can cause conjunctival scarring Can be focal, multifocal or diffuse Severity ranges from trivial to sight threatening Many potential causes:</p> <ul style="list-style-type: none"> <li>• Trauma <ul style="list-style-type: none"> <li>○ surgery</li> <li>○ thermal, radiation, mechanical, chemical</li> </ul> </li> <li>• Autoimmune <ul style="list-style-type: none"> <li>○ Ocular Cicatricial Pemphigoid (OCP)</li> <li>○ Stevens-Johnson syndrome (erythema multiforme major)</li> <li>○ Graft versus Host disease</li> </ul> </li> <li>• Infection (N.B. very few forms of infective conjunctivitis cause scarring) <ul style="list-style-type: none"> <li>○ trachoma (recurrent infection by <i>Chlamydia trachomatis</i> [serotypes A-C])</li> </ul> </li> <li>• Allergy <ul style="list-style-type: none"> <li>○ Vernal Keratoconjunctivitis (see Clinical Management Guideline)</li> <li>○ Atopic Keratoconjunctivitis (see Clinical Management Guideline)</li> </ul> </li> <li>• Ligneous conjunctivitis</li> </ul> <p>Secondary effects of conjunctival scarring, often in combination, leading to dry eye with corneal keratinisation and opacification in severe cases:</p> <ul style="list-style-type: none"> <li>• reduced tear constituents</li> <li>• disturbance of lid function (poor tear spreading)</li> </ul>
<p><b>Predisposing factors</b></p>	<p>OCP is primarily a disease of the elderly Stevens-Johnson syndrome usually occurs in previously healthy young adults</p> <ul style="list-style-type: none"> <li>• hypersensitivity reaction precipitated by many different antigens including <ul style="list-style-type: none"> <li>○ bacteria, viruses, fungi, drugs</li> </ul> </li> </ul> <p>Trachoma: a disease of under-privilege and compromised hygiene</p> <ul style="list-style-type: none"> <li>• globally, the leading infectious cause of blindness</li> </ul> <p>Atopic keratoconjunctivitis typically affects young atopic adults</p>
<p><b>Symptoms</b></p>	<p>Symptoms depend on severity and type of scarring Reduced tear components and compromised lid function both lead to dry eye</p> <ul style="list-style-type: none"> <li>• grittiness, burning, foreign body sensation</li> <li>• blurred vision in severe cases</li> </ul>
<p><b>Signs</b></p>	<p>Depends on aetiology Surgical and traumatic scarring</p> <ul style="list-style-type: none"> <li>• focal, linear or diffuse scarring according to cause</li> </ul> <p>OCP produces sequence of conjunctival changes</p> <ul style="list-style-type: none"> <li>• bilateral (often asymmetrical)</li> <li>• diffuse conjunctival hyperaemia, papillae</li> <li>• bullae leading to ulceration and pseudomembrane formation</li> <li>• subepithelial fibrosis and shrinkage</li> <li>• secondary corneal changes</li> </ul>

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	<p>Stevens-Johnson syndrome produces sequence of conjunctival changes</p> <ul style="list-style-type: none"> <li>• acute bilateral mucopurulent conjunctivitis</li> <li>• fibrosis and keratinisation follow acute phase</li> <li>• secondary corneal changes due to tear deficiency, exposure, contact with keratin at lid margin</li> </ul> <p>Vernal keratoconjunctivitis</p> <ul style="list-style-type: none"> <li>• tarsal sub-conjunctival fibrosis</li> <li>• pannus (especially at upper limbus)</li> </ul> <p>Atopic keratoconjunctivitis</p> <ul style="list-style-type: none"> <li>• tarsal sub-conjunctival fibrosis</li> <li>• conjunctival shrinkage</li> <li>• forniceal shortening</li> </ul> <p>Trachoma</p> <ul style="list-style-type: none"> <li>• follicles (upper tarsus)</li> <li>• pannus (especially at upper limbus)</li> <li>• conjunctival inflammation leading to scarring and trichiasis <ul style="list-style-type: none"> <li>○ Von Arlt's line (horizontal line of scarring parallel to lid margin)</li> </ul> </li> <li>• Herbert's pits (depressions at the upper limbus representing resolved limbal follicles)</li> <li>• secondary corneal changes</li> </ul>
<b>Differential diagnosis</b>	<p>A comprehensive ophthalmic and medical history should reveal the cause</p> <p>If no apparent cause, rule out early stages of OCP</p>
<b>Management by Optometrist</b>	
Practitioners should recognise their limitations and where necessary seek further advice or refer the patient elsewhere	
Non pharmacological	<p>Check for signs of dry eye</p> <ul style="list-style-type: none"> <li>• reduced tear meniscus</li> <li>• low tear break up time</li> <li>• stain with vital dye(s) as available</li> </ul> <p>Check for signs of mechanical trauma to cornea due to:</p> <ul style="list-style-type: none"> <li>• trichiasis, keratinised tarsal conjunctiva</li> </ul> <p>Taping to reduce entropion (temporary measure)</p> <p>Taping lids together at night in lagophthalmos</p> <p style="color: red;">(GRADE*: Level of evidence=low, Strength of recommendation=strong)</p> <p>Therapeutic contact lens. All types of lens have been used. When the eye is relatively dry the first choice may be a scleral lens:</p> <ul style="list-style-type: none"> <li>• to prevent desiccation by maintaining a fluid layer beneath the lens</li> <li>• to prevent trauma from keratinised lids</li> <li>• to promote healing of epithelial defects</li> </ul> <p style="color: red;">(GRADE*: Level of evidence=low, Strength of recommendation=weak)</p>
Pharmacological	<p>Ocular lubricants for tear deficiency/instability related symptoms (drops for use during the day, unmedicated ointment for use at bedtime)</p> <p><i>NB Patients on long-term medication may develop sensitivity reactions which may be to active ingredients or to preservative systems (see Clinical Management Guideline on Conjunctivitis Medicamentosa). They should be switched to unpreserved preparations</i></p> <p style="color: red;">(GRADE*: Level of evidence=low, Strength of recommendation=strong)</p>
<b>Management Category</b>	<b>Mild scarring resulting from minor trauma or surgery:</b>



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	<p><b>B2:</b> alleviation / palliation: normally no referral Moderate to severe scarring:</p> <p><b>B1:</b> initial management (including drugs) followed by routine referral Any conjunctival scarring of unknown aetiology should be referred</p> <p><b>A3:</b> Urgent referral (within one week) if ocular autoimmune disease is suspected</p>
<b>Possible management by Ophthalmologist</b>	
	<p>Topical and/or systemic immunosuppression if autoimmune aetiology Conjunctival or buccal mucus membrane grafts, stem cell transplantation, amniotic membrane transplantation, lid surgery (but surgery in OCP can stimulate inflammation and produce further scarring)</p>
<b>Evidence base</b>	
	<p><b>*GRADE: Grading of Recommendations Assessment, Development and Evaluation (see <a href="http://gradeworkinggroup.org/toolbox/index.htm">http://gradeworkinggroup.org/toolbox/index.htm</a>)</b></p> <p><i>Sources of evidence</i></p> <p>Ciralsky JB, Sippel KC, Gregory DG. Current ophthalmologic treatment strategies for acute and chronic Stevens-Johnson syndrome and toxic epidermal necrolysis. <i>Curr Opin Ophthalmol.</i> 2013;24(4):321-8</p> <p>Radford CF, Rauz S, Williams GP, Saw VP, Dart JK. Incidence, presenting features, and diagnosis of cicatrising conjunctivitis in the United Kingdom. <i>Eye (Lond).</i> 2012;26(9):1199-208</p> <p>Rajak SN, Makalo P, Sillah A, Holland MJ, Mabey DC, Bailey RL, Burton MJ. Trichiasis surgery in The Gambia: a 4-year prospective study. <i>Invest Ophthalmol Vis Sci.</i> 2010;51(10):4996-5001</p> <p>Saw VP, Minassian D, Dart JK, Ramsay A, Henderson H, Poniatowski S, Warwick RM, Cabral S. Amniotic membrane transplantation for ocular disease: a review of the first 233 cases from the UK user group. <i>Br J Ophthalmol</i> 2004;91:1042-7</p>

### LAY SUMMARY

Many conditions can cause the conjunctiva, the thin transparent membrane covering the white of the eye and the underside of the eyelids, to become scarred. These include injury, infection, allergy and autoimmune diseases, in which the body's immune system attacks its own cells or tissues. On a global scale, a major cause of conjunctival scarring and blindness is an infectious disease called trachoma, which is not common in the UK but affects many millions of people in North Africa and South Asia.

Scarring damages the conjunctiva and makes it less able to retain tears and protective mucus. Patients may have symptoms of dry eye, with grittiness, burning and, in severe cases, blurred vision. They may be helped by artificial tear drops, eyelid surgery and surgical transplantation of membranes on to the eye surface.