CULOPLASTICS

DR MARIA DE BONO

HISTORY OF OCULOPLASTICS SURGERY

Oculoplastics surgery is a relatively "new" subspecialty within Ophthalmology which deals with disorders of the lids, lacrimal system and orbits. Like any other surgical subspecialty, oculoplastics was born out of a need to provide specialized surgical care and in this particular case, to people suffering from severe eyelid disease, trauma and watery eye problems. One can say that this particular line of surgery originated from a 'cross breed' between plastic surgery and ophthalmology.[1]

The influential British plastic surgeon Jack Mustardé*, way back in the 1960s, was beginning to hope that "in the future we might see a generation of surgeons arising who would be, fundamentally, either plastic surgeons or ophthalmic surgeons, but who would take specific training of some sort in the contralateral field."[2] He went on to say that "I had the honour to be invited to speak at conferences by both plastic surgeons and ophthalmic surgeons. The plastic surgeons didn't know enough ophthalmology to contradict me, and the ophthalmic surgeons didn't know enough plastic surgery to contradict me either!"[2]

A few years later - in 1969 - the American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) was founded with a view to establish a qualified body of surgeons with the required training and experience in this highly specialized field; the European Society (ESOPRS) was set up in 1982 and the British Oculoplastics Surgical Society (BOPSS) in 2000.

It is now standard practice internationally to have ophthalmologists trained in oculoplastic surgery because this allows them to apply the micro precision of ophthalmology to the aesthetic concepts of facial plastic surgery.

APPLICATIONS

The applications of oculoplastics surgery are diverse. These include any eyelid malposition including involutional or cicatricial ectropion (everted eyelid) and entropion (inverted eyelid), brow ptosis, blepharoptosis and dermatochalasis which all can cause a droopy eyelid. The commonest cause for blepharoptosis in adults is gradual, age-related stretching of the levator palpebrae aponeurosis tendon known as involutional ptosis. The levator muscle itself is not affected and so the movement of the eyelid from looking up to down remains normal. Long term contact lens wear can cause ptosis, possibly related to the repeated insertion and removal of the lens causes stretching of the tissues. Sometimes ptosis follows other eye surgery (such as cataract surgery) or an injury. If clinically significant, involutional ptosis can be treated surgically using different approaches, the most recent being the "posterior approach white line advancement" whereby the levator aponeurosis is approached from the underside of the eyelid and tightened to the superior edge of the tarsal plate. This is advantageous since it does not create any skin incisions. Another commonly used technique is the anterior approach aponeurosis advancement – this technique is favoured when a blepharoplasty is also needed to remove some excess eyelid skin – where a skin crease incision is created and the septum opened to isolate the levator aponeurosis which is then tightened to the tarsus.

Other conditions which are commonly treated include benign lid lumps including cysts, xanthelasma, seborrheic keratosis and chalazia. Removal of eyelid tumours with adequate margins, most commonly basal cell carcinoma, squamous cell carcinoma and melanoma are also carried out; lid reconstruction then involves direct closure, various flaps or full thickness skin grafting depending on the size and location of the primary defect.[3]

Patients with facial nerve palsy also fall under oculoplastic care. The aim is to protect the ocular surface until nerve function recovers in idiopathic cases or in the longer term in patients in whom the facial nerve had to be compromised during surgery to treat the underlying condition such as acoustic neuroma or parotid tumour. In these cases, if the cornea is at high risk of breakdown, an emergency tarsorrhaphy is carried out. However, in most cases we tend to partially join the lids [and not carry out a complete tarsorrhaphy] for a short period of time as patients find it cosmetically unacceptable and also because it decreases their field of view. Putting in an eyelid weight (gold or platinum) helps to improve their blink excursion and lid closure. Some patients also suffer a paralytic ectropion which can be corrected by doing an augmented lateral tarsal strip with or without a medial canthal tendon tightening.[4]

Oculoplastic surgeons also manage patients with Thyroid eye disease.[5] Thyroid eye disease can be sight threatening or non-sight threatening. Treatment is targeted depending on the severity of the condition. Ocular structures involved in the inflammatory process include the eyelids, ocular surface, extraocular muscles and intraorbital fat. Eventual scarring of the eyelid muscles and deposition of extra fat in the eyelids causes them to be puffy and retracts the eyelids away from the eye causing exposure of the eye. These changes alter a person's appearance in a disturbing way but also introduce a medical problem of exposure of the eye and cornea which can threaten vision. Many people will have exposure to the degree that it causes their eyes to be very gritty and watery and discomfort is their major problem. In some people, however, dry spots will actually form on the surface of the eye causing exposure keratitis which can lead to scarring and damage to the eye. In the mild inactive state of thyroid eye disease, selenium supplementation and maintenance of the euthyroid state have shown to be beneficial for non-progression of the condition. In the more severe active stages, intravenous methylprednisolone over a course of 12 weeks is necessary.[6] Upper eyelid lowering (temporarily using Botox or permanently by surgery) is necessary so that the eyelids are able to protect the eye more adequately and an improvement in appearance can also be obtained.

Other conditions include blepharitis and closely related meibomitis. There are two types of blepharitis: a) anterior blepharitis occurring at the outside front edge of the eyelid where the eyelashes are rooted, and b) posterior blepharitis affecting the inner edge of the eyelid that is in contact with the eyeball.[7] A diagnosis of the specific type of blepharitis can often be made based on the appearance of the eyelid margins. Blepharitis and meibomitis can be associated with chalazia and conjunctival concretions. Treatment depends on the specific type of blepharitis. The key to treating most types of blepharitis is keeping the eyelids

clean and crust-free by means of warm compresses and good lid hygiene; however, refractory cases of anterior blepharitis may require more complex treatment plans such as BlephEx™ which is a revolutionary new patented hand piece, used to very precisely and carefully spin a medical grade micro-sponge along the edge of the eyelids and lashes, removing scurf and debris and exfoliating the eyelids. For refractory posterior blepharitis, tetracycline antibiotics are used not only for their antimicrobial properties but also for their strong anti-inflammatory action when used in sub-antimicrobial concentrations. These antibiotics have been shown to inhibit the production of pro-inflammatory mediators, thus reducing the production of inflammatory compounds such as cytokines and chemokines, and in particular, matrix-metalloproteineases.[8]

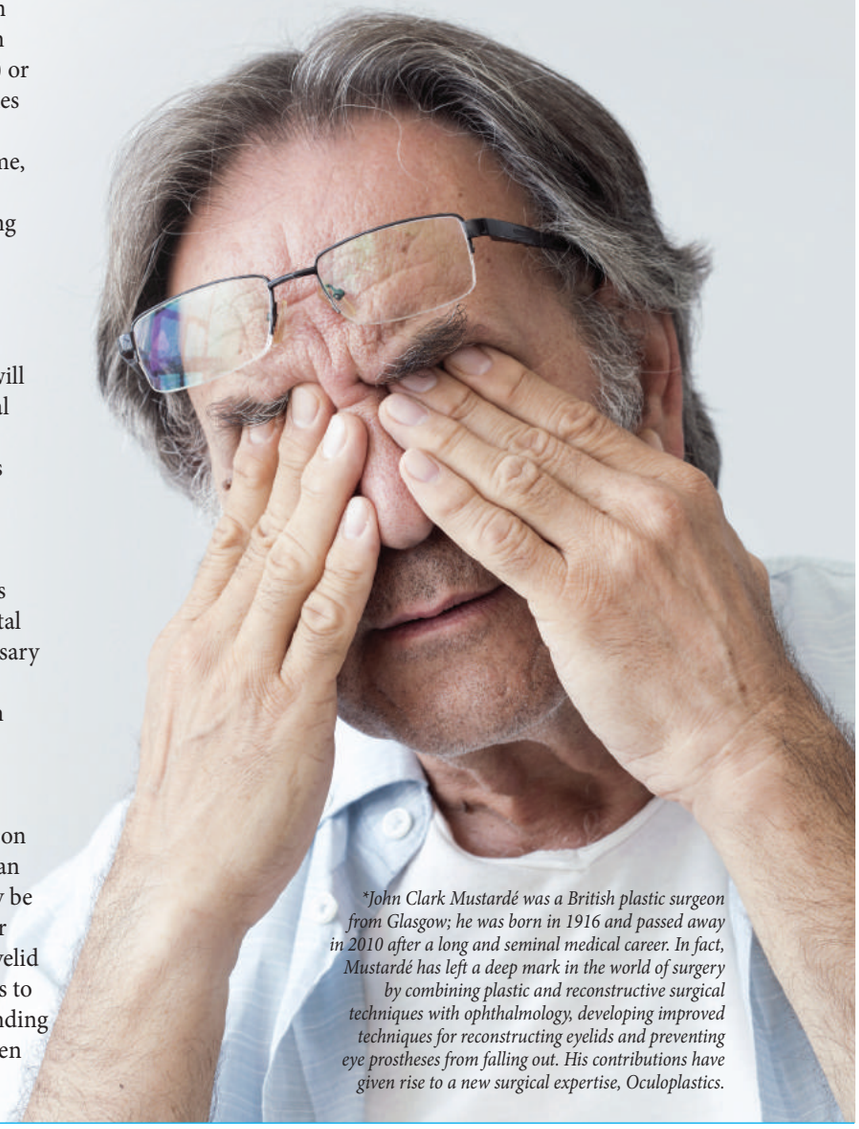
Extreme circumstances at times necessitate the removal of an eye, indicated when the eye becomes painfully blind or in cases of ocular tumours. This could be either an evisceration (removal of the eye's contents leaving the scleral shell intact) or enucleation (removal of the whole eye leaving the eye muscles and remaining orbital contents intact). These patients can then develop Post-Enucleation/Evisceration Socket Syndrome, including sunken appearance of the eye, usually years after removal of the eye; oculoplastic surgeons face the challenging task to try to achieve a symmetrical and natural look to the corresponding eye as much as possible.

ROLE OF OCULOPLASTIC SURGERY IN PAEDIATRICS

The commonest conditions that an oculoplastics specialist will deal with are congenital ptosis, dermoid cysts and congenital nasolacrimal obstruction. Historically congenital ptosis has been thought of as a disorder of levator palpebrae superioris development, however newer theories are more focused on disordered muscle innervation. Deprivational amblyopia (when vision fails to develop adequately) is the commonest association with ptosis in childhood – in the literature this is quoted as being present in 20-70% of children with congenital ptosis.[9,10] Close follow-up with orthoptists is therefore necessary to monitor visual development, since if this is seen as being adequate, then surgery can be postponed to a later age when surgical results are more predictable.

Dermoid cysts are generally the commonest periorbital mass presenting in childhood. These are developmental choristomas; in the periocular area they are often evident soon after birth, with parents raising concern about the lump, or an asymmetry of the eyelids or brows. More rarely the cyst may be asymptomatic until it presents with apparent enlargement or with inflammatory symptoms—such as pain, redness and eyelid swelling. These cysts are normally excised in childhood so as to avoid potential rupture which can lead to fibrosis to surrounding structures. Surgically a skin crease approach is normally taken so as to achieve the best cosmetic outcomes.

Congenital nasolacrimal duct obstruction is the commonest cause of childhood epiphora. It is most commonly due to failure of initial opening of nasolacrimal duct (NLD) into the inferior meatus by birth at the level of the valve of Hasner, stenosis of the opening from narrowed `NLD or hypertrophied inferior turbinate. Spontaneous resolution occurs in 96% of children in the first year without intervention and a further 60% will resolve in the second year of life.[8,11] Therefore management is normally conservative with parents being taught how to perform regular lid hygiene and lacrimal sac massage. Probing is reserved for cases which are persistent; current evidence suggests deferring this until the age of 18-24 months due to the natural history of this condition and the risks associated with general anaesthesia on neurodevelopment of the child under the age of 2 years.



**John Clark Mustardé was a British plastic surgeon from Glasgow; he was born in 1916 and passed away in 2010 after a long and seminal medical career. In fact, Mustardé has left a deep mark in the world of surgery by combining plastic and reconstructive surgical techniques with ophthalmology, developing improved techniques for reconstructing eyelids and preventing eye prostheses from falling out. His contributions have given rise to a new surgical expertise, Oculoplastics.*

REFERENCE

1. Meltzer MA, Ostrovsky A. Ophthalmic Plastic Surgery: A History in the Making. In: Black E, Nesi F, Calvano C, Gladstone G, Levine M, eds. Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery. New York: Springer; 2012. p.81-96.
2. Rogers BO. History of oculoplastic surgery: The contributions of plastic surgery. Aesth Plast Surg 1988; 12(3):129–152.
3. Patel SY, Itani K. Review of Eyelid Reconstruction Techniques after Mohs Surgery. Semin Plast Surg 2018; 32(2): 95-102.
4. Allen RC. Controversies in periocular reconstruction for patients with facial nerve palsy. Curr Opin Ophthalmol 2018; 29(5):423-427.
5. Dolman PJ. Grading Severity and Activity in Thyroid Eye Disease. Ophthalmic Plast Reconstr Surg 2018; 34(4S Suppl 1):S34-S40.
6. Jackson WB. Blepharitis: current strategies for diagnosis and management. Can J Ophthalmol 2008; 43(2):170-9.
7. Bartalena L, Bladeschi L, Boboridis K et al. The 2016 European Thyroid Association/European Group on Graves' Orbitopathy Guidelines for the Management of Graves' Orbitopathy. *Eur Thyroid J* 2016;5(1):9-26.
8. Liu Y, Kam WR, Ding J et al. Can tetracycline antibiotics duplicate the ability of azithromycin to stimulate human meibomian gland epithelial cell differentiation? *Cornea* 2015;34(3):342-6.
9. Gusek-Schneider GC, Martus P. Stimulus deprivation amblyopia in human congenital ptosis: a study of 100 patients. *Strabismus* 2000; 8(4) 261-270.
10. Oral Y, Ozgur OR, Ackay L et al. Congenital Ptosis and Amblyopia. *JPOS* 2010; 47(2):101-4.
11. Olver J. Colour Atlas of Lacrimal Surgery. London: Elsevier Health Sciences; 2002.