

Surgical correction of persistent eyelid lymphoedema after radiotherapy: four case reports

HY Chan¹*, MB, BS, MRCSEd, Leo KY Chan², MB, ChB, MSc, Tracy YT Kwok², FCOphthHK, FHKAM, Hunter KL Yuen², FRCSEd, FRCOphth (UK)

¹ Department of Ophthalmology and Visual Sciences, Prince of Wales Hospital, Hong Kong SAR, China

² Department of Ophthalmology, Hong Kong Eye Hospital, Hong Kong SAR, China

* Corresponding author: chy896@ha.org.hk

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Case presentations

Case 1

A 40-year-old man presented with right upper lid swelling for several months. There was no pain or redness. He had received radiotherapy for nasopharyngeal carcinoma 12 years ago. The swelling did not respond to antibiotics nor non-steroidal anti-inflammatory medication. On examination, there was mechanical ptosis and loss of skin crease. The marginal reflex distance, palpebral fissure height (PFH), and levator function on the right eye were 2 mm, 8 mm, and 8 mm, respectively. Extraocular movement was normal and there was no proptosis (Fig 1a).

The diagnosis was periocular lymphoedema affecting mainly the right upper lid. He underwent right upper lid blepharoplasty, levator resection with biopsy, debulking of orbital septum, preseptal tissues

and preaponeurotic fat pad, and lid crease formation under local anaesthesia. Histological examination revealed skin, adipose tissue and fibrovascular tissue with no evidence of malignancy. Postoperatively, there was significant improvement in symptoms and cosmesis (Fig 1b) and no recurrence after 9 months.

Case 2

A 57-year-old woman underwent left hemiglossectomy and adjuvant radiotherapy for carcinoma of tongue. She presented with gradual swelling of the left upper lid causing visual obstruction. Examination revealed left upper lid swelling with secondary mechanical ptosis (Fig 2a). Her marginal reflex distance PFH, and levator function on the left eye were 0 mm, 4 mm, and 9 mm, respectively. There was also left hemifacial swelling. Visual acuity, intraocular pressure, fundal and pupil examination, and extraocular movement were all



FIG 1. Case 1. (a) Right upper lid lymphoedema with mechanical partial ptosis and loss of skin crease. (b) Postoperative picture following right upper lid blepharoplasty, levator resection, biopsy, and lid crease formation. There was reduced swelling, improved partial ptosis, and restoration of lid crease



FIG 2. Case 2. (a) Left upper lid and left hemifacial swelling. There was mechanical partial ptosis, loss of lid crease, and no signs of inflammation. (b) Postoperative picture showing resolved lid swelling, improved ptosis, and reformation of lid crease

normal. There were no signs of recurrent carcinoma of tongue and no palpable cervical lymph nodes.

Similar to Case 1, surgical correction of eyelid lymphoedema was performed. Postoperatively, lid swelling resolved with reformation of lid crease (Fig 2b). The patient remained well 4 years after the surgery with no recurrence.

Case 3

A 71-year-old man received radiotherapy for nasopharyngeal carcinoma in 1982. He presented with persistent non-pitting left upper lid swelling for 20 years. Incisional biopsy performed in 2004 revealed non-specific changes with no malignant cells. Additional eyelid surgery was offered but the patient opted for conservative management. Interval computed tomography imaging showed left eyelid swelling with no retrobulbar mass, and rectus muscles were not thickened. Examination revealed left upper lid swelling with secondary mechanical ptosis and loss of lid crease. Marginal reflex distance, PFH, and levator function on the left eye were 0 mm, 1 mm, and 5 mm, respectively. Extraocular movement and other physical examinations were normal.

Due to persistent symptoms, the patient elected surgical correction of eyelid lymphoedema. Biopsy showed no signs of malignancy. Postoperatively, left upper lid swelling resolved. The patient remained well 3 years postoperatively with no recurrence.

Case 4

A 65-year-old woman presented with persistent right upper lid swelling in 2008. She had a history of nasopharyngeal carcinoma (T2N2M0) treated with radiotherapy in 1995. There was non-pitting oedema of the right upper lid. Liver and renal function tests were normal. She had no oedema in her extremities or elsewhere.

Computed tomography of the orbits showed smooth soft tissue oedema of the right upper lid with no abnormal mass. Cavernous sinuses were normal. Patchy sclerosis in the skull base was present and thought to represent post-radiotherapy changes.

Right upper lid blepharoplasty had been performed elsewhere in March 2009, where excessive and thickened skin was excised together with hypertrophic orbicularis muscles. The orbital septum was kept intact with preservation of the preaponeurotic fat pad. A similar repeat procedure was performed 4 months later by the same surgeon for persistent symptoms.

In 2019, the patient presented to us with residual bilateral upper lid oedema. Palpebral fissure height was 5 mm on the right eye and 6 mm on the left. Marginal reflex distance was 0 mm on the right eye and 1 mm on the left. Levator function was 9 mm on both eyes. There was secondary mechanical partial

ptosis, loss of lid crease, and facial lymphoedema.

Surgical correction of eyelid lymphoedema was performed. Histological examination was compatible with lymphoedema. The patient recovered well postoperatively and there was no recurrence 6 months after surgery.

Discussion

There are only a few reports of eyelid lymphoedema following neck dissection, surgery or radiation.¹⁻³ As none of our cases underwent neck dissection, we hypothesise that radiotherapy alone can impede lymphatic drainage with consequent periorcular lymphoedema. In this series, eyelid lymphoedema was frequently related to nasopharyngeal carcinoma, unlike other series.

Eyelid lymphoedema presents as a non-pitting oedema with thickening of the eyelid. In cases with severe swelling, visual field defect and disfigurement may occur.

Rosacea is the most reported eyelid lymphoedema association, albeit rare. More common presentations are blepharitis, conjunctivitis, and meibomianitis.³⁻⁷

Lymphoedema can usually be managed conservatively with manual drainage, compression garments, and skin care.⁸ Medical therapy with tetracycline and steroids have limited efficacy.^{4,5,7} Surgical treatment by debulking and split thickness skin grafting has been reported with favourable results.^{3,4,9} Lymphovenous anastomosis or bypass is also performed to divert lymphatic drainage to venous circulation.¹⁰ Nonetheless this is difficult in the periorcular region where a lack of large superficial veins may result in an unsightly facial scar. Therefore, surgical debulking may remain the treatment of choice.

For surgical debulking, excessive skin and orbicularis should be addressed. Orbital septum debulking is essential since fluid tends to accumulate in this loose connective tissue. Debulking of the preaponeurotic fat pad can reduce upper lid swelling and enhance formation of skin crease. In our fourth case without such debulking, there was residual swelling. We addressed this in her last surgery resulting in marked improvement. In all four cases, there was no recurrence as the loose connective tissue was removed with orbital septum and preaponeurotic fat pad debulking. Levator resection should be performed in cases with long-standing oedema and levator muscle dysfunction. Skin crease forming sutures are placed for symmetry with the opposite eye, noting that Asian patients have thicker skin and orbicularis muscle, affecting skin crease formation and margin reflex distance. We prefer an incision 1 to 2 mm lower than the opposite normal side for better symmetry. Although surgery can improve eyelid oedema, patients should be informed

that abnormal-appearing skin will persist. The longevity of improvement may be enhanced with presence of scar tissue making oedematous fluid less likely to accumulate.

Author contributions

Concept or design: All authors.
 Acquisition of data: All authors.
 Analysis or interpretation of data: All authors.
 Drafting of the manuscript: All authors.
 Critical revision of the manuscript for important intellectual content: HY Chan, HKL Yuen.

All authors had full access to the data, contributed to the study, approved the final version for publication, and take responsibility for its accuracy and integrity.

Conflicts of interest

As an editor of the journal, HKL Yuen was not involved in the peer review process. Other authors have disclosed no conflicts of interest.

Declaration

Case 2 in this study has been previously published in part in: Yuen KLH, Kwok YT. Surgical management of unusual eyelid swelling. *iPlastics: official newsletter of the Asia Pacific Society of Ophthalmic Plastic and Reconstructive Surgery*; 2016; 2(4): 4-6. Permission from the newsletter editor for publication of the case has been obtained. The authors confirm that there is no intentional or unintentional plagiarism in the present manuscript.

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Ethics approval

This study was conducted in accordance with the Declaration of Helsinki. All patients were informed of the purpose of the study and their consent was obtained for all treatments, procedures, photography, and publication.

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