Spontaneous reformation of lower eyelid

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SUMMARY Eleven consecutive patients with tumours involving the lower eyelid margin were treated with margin-including full-thickness excision of the eyelid and suturing of bleeding vessels as the sole primary surgical procedure, needing less than 10 minutes. The resulting defects of 2/5 to 7/8 of the horizontal extent of the eyelid and varying in height from 4 to 7 mm were allowed to heal spontaneously. In all the 11 patients the wounds healed, without ocular or palpebral complications in about 6 weeks and underwent further cosmetic improvement for the ensuing 6-8 weeks. Cosmetic results were excellent in 8 patients with excisions of 2/5 to $\frac{1}{2}$ of the eyelid. All procedures including the secondary reconstructions were carried out on day-case basis under local anaesthesia. Histology confirmed complete tumour clearance in all the patients. Apart from being the first report of a planned study of spontaneous repair of full-thickness surgical wounds of the lower eyelid this study shows that the conventional method of dressing such wounds can be replaced by the less expensive and convenient 'dressing' of a cartella shield with an improvised central hole.

In the surgical management of tumours involving the lower eyelid full-thickness excision of an appropriate portion of the eyelid is necessary if the malignancy involves or is likely to involve the eyelid margin. After such margin-including excisions immediate surgical reconstruction has been assumed to be mandatory. If the defect is less than one-third of the horizontal span of the eyelid, it is customary to repair it with direct multilayer suturing. For larger defects a multitude of techniques of varying complexities have been advocated. It may be neither possible nor desirable to implement immediate reconstructive surgery in some patients for reasons of health or other considerations. In 2 such patients of mine full-thickness excision of the medial half of the lower eyelid was left to heal spontaneously. The extremely satisfactory results obtained in these 2 patients—one reported previously¹—prompted this study.

Patients and methods

Eleven consecutive patients with tumours at or near the lower eyelid margin are included in this study. Of these, 8 patients had the tumour confined only to the lower eyelid. Of the remaining 3 patients,

in addition to involvement of the eyelid margin 1 patient had minimal extension of the tumour just medial to the lacrimal punctum; 1 had progressive extension of the tumour for 15 years to involve 2 cm of the infrapalpebral and inner canthal tissues; and 1 patient had a slowly progressive rodent ulcer for 35 years. It occupied 7/8 of the horizontal extent of the eyelid and extended beyond the lower orbital margin. In this patient and another with a suspected rodent ulcer a frozen section biopsy was performed prior to undertaking radical excision.

At the initial consultation all patients were offered the choice of having a simple excision that was to be allowed to heal spontaneously or of undergoing primary reconstructive surgery. It was explained to them that there was insufficient published evidence of the results of spontaneous healing, but my own limited experience tended to suggest that acceptable results were likely to ensue. They were also reassured that, if the final result of natural healing was unacceptable, secondary reconstruction(s) would be possible. The patients were given adequate explanation of the commoner methods of full-thickness lower-eyelid reconstruction. They all opted to undergo simple excision with natural healing as the initial management. Two patients were below the age of 50, the oldest patient was 93, and the average age was 65 years. The follow-up ranged between 30 months and 3 months, with an

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average observation of 10.7 months. All excised lesions were examined histologically for confirmation of diagnosis and tumour clearance.

Apart from cauterisation and ligation of bleeding vessels the excision was the sole primary surgical procedure in these patients. Full-thickness excision of the lower eyelid including the lid margin was carried out in all the 11 patients (Tables 1 and 2). The minimum excision was of 2/5 of the horizontal span of the eyelid, and the maximum excision involved the entire lower eyelid except for a stump of about 1 mm at each canthus. The vertical extent of the excision measured from the lid margin was 4 mm in 2 patients and 5 mm or more in 9 patients. In 5 patients the medial half of the eyelid was excised. Of these, 3 excisions were confined only to the eyelid; one additionally included the neighbouring centimetre of inner canthus; and one also involved the adjacent 25×20 mm of infrapalpebral and inner canthal skin and orbicularis. In the remaining 6 patients the tumours involved the intercanthal portion of the lid margin. Of these, 5 excisions were confined only to the eyelid, and 1 excision included almost the entire lower lid together with 2 cm of infrapalpebral skin and orbicularis. Of the 5 purely intercanthal excisions 2 were of the central half of the eyelid, 1 of the central two-thirds of the lid, and 2 were of temporal off-centre two-fifths of the eyelid. None of the tumours needed excision that reached the outer canthus itself.

SURGICAL TECHNIQUE AND GENERAL MANAGEMENT

All the excisions were carried out under local anaesthesia with lignocaine 2% and bupivacaine 0.5% with adrenaline (Marcain)—the latter to

Table 1 *Details of 8 patients who had margin-including full-thickness excisions of two-fifths to two-thirds of the horizontal span of the lower eyelid. The vertical extent of the excisions was 4–7 mm. The excisions were confined to the eyelids only. For both tables the patients are numbered in chronological order of excisions, and their age in years is bracketed*

	Site and extent of excision	Results
Case 2 (73) Case 4 (46) Case 5 (49)	Medial 2/5–1/2 in horizontal extent and 5 mm in vertical extent	Excellent Fig. 1
Case 8 (55) Case 11 (67)	Central 1/2 of lower eyelid, 6–7 mm in vertical extent	Excellent Fig. 2
Case 6 (68)	Central 2/3 of lower eyelid, 5 mm vertical extent	Just acceptable Fig. 3
Case 9 (64) Case 10 (65)	Off centre lateral 2/5 with 4 mm vertical excision	Excellent

Table 2 *Details of 3 patients in whom excision of parpalpebral tissues was confluent with lid margin including full-thickness excision of half to seven-eighths of the lower eyelid*

	Site and extent of excision	Results and comments
Case 1 (76)	Medial 1/2 eyelid and surrounding 10 mm of inner canthal tissues 5 mm vertical extent of the excision	Excellent (has now recovered from initial moribund state that compelled minimal surgery)
Case 3 (93) Fig. 4	Medial 1/2 eyelid and 20×25 mm of infrapalpebral skin and orbicularis 6 mm of vertical excision	Natural healing of eyelid including the margin was excellent. Ectropion due to surrounding fibrosis relieved by secondary reconstruction with a 12×18 mm full-thickness skin graft. Very satisfactory final result
Case 7 (69) Fig. 5	Almost the entire lower lid and 20×27 mm of infrapalpebral skin and orbicularis. Full vertical extent of the eyelid and beyond	Poor cosmesis after natural healing no worse than the very poor preoperative appearance. Sufficient conjunctiva regenerated to enable secondary repair with a small tarsoconjunctival flap and full-thickness skin graft. The secondary procedure was equally extensive but more difficult than a primary one would have been. Final cosmesis satisfactory

delay the onset of postoperative pain. The area to be excised was marked out *before* injecting the local anaesthetic. The excision may be inadequate if the marking is done after the distortion and stretching of the tissues by the injection. To achieve symmetry of clinical clearance the eyelid excisions were rectangular, with edges made perpendicular with a No. 15 Bard-Parker blade. Large bleeding vessels were ligated with 6–0 polyglycolic acid (Dexon) sutures, and smaller oozing vessels were cauterised. Antibiotic eye ointment was instilled, and a cartella shield with a central hole (about 15 mm diameter, to prevent visual obstruction) was given as the sole 'dressing' for 3 weeks. The patients were discharged home within an hour of the excision. They were given cotrimoxazole (Septrin) 2 tablets twice daily for 5 days, and chloramphenicol or neomycin eye ointment once daily for 2 weeks. They were called for first-dressing at 48 hours, and then every week for 4 weeks, after which the follow-up period was progressively increased to attain 6-monthly observations.

Fig. 1 (a) Preoperative appearance of rodent ulcer near the lower eyelid margin in a woman aged 49. (b) Full-thickness excision of medial half of eyelid, with ligation of bleeding vessels. The wound was allowed to granulate. (c), (d) Appearance at 2 and 3 weeks, showing healthy repair. (e), (f) Final result at 3 and 16 months respectively possesses all the attributes of an ideally reformed eyelid. The newly formed lid is neither limp nor taut, and has optimal innate firmness to yield a permanently stable lid margin. It has adequate resilience to conform to the contours of the globe, and has enough height to form a proper fornix and to come up to the limbus.

Fig. 2 (a) Rodent ulcer at the centre of lower eyelid in a woman of 55. (b) Immediate postoperative appearance after full-thickness excision of the central half of lower eyelid. The wound was allowed to heal spontaneously. (c) Appearance at first postoperative week. (d) Appearance at 3 weeks. (e), (f) Final result at 3 months and 13 months respectively.

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Fig. 3 (a) Rodent ulcer of lower eyelid margin in a woman aged 68—preoperative appearance. (b) Full-thickness excision of central two-thirds of the eyelid, immediate postoperative appearance. The wound was allowed to granulate. (c) Appearance 9 days post-operatively. (d) Final result of natural healing at 4 months. Secondary repair with tarsconjunctival flap from ipsilateral upper eyelid, and a full-thickness skin graft performed 18 months after initial excision. (e) Result 8 weeks after the secondary repair.

Fig. 4 (a) Preoperative appearance of squamous carcinoma involving medial part of lower eyelid, inner canthus, and infraorbital region. The tumour progressed over 15 years in this 93-year-old woman. (b) Extensive excision included full-thickness removal of medial half of the eyelid. The wound was allowed to heal spontaneously. (c) Appearance on the 9th postoperative day. The lower fornix is seen being reformed, and the wound appears healthy. (d) Result of natural healing at 4 months shows a well reformed eyelid including the fornix. The ectropion is due to cicatricial tug from the infrapalpebral region. (e) Final result after a minor secondary repair (15 months after initial resection) with excision of nonpalpebral cicatrix, and its replacement by a full-thickness skin graft under local anaesthesia as a day case. A larger skin graft might have obviated the slightly taut lid margin at the inner canthus. It is very likely that primary surgical reconstruction in this patient would have entailed extensive surgery, with possible hazard to general health at her age of 93.

Fig. 5 (a) Basal cell epithelioma, progressively involving the entire eyelid and infrapalpebral region over 35 years in a man aged 69. (b) Full-thickness excision of almost the entire lower eyelid, including infrapalpebral skin and orbicularis. Suture knots of ligated vessels are seen. The wound was allowed to granulate. (c) Appearance 3 weeks postoperatively. (d) Final appearance of spontaneous repair at 6 months. Note the abundant 'regeneration' of the conjunctiva. Therefore at secondary reconstruction only a small tarsoconjunctival flap from the upper eyelid was needed to form the mucosal layer. The outer lamina was recreated with a full-thickness skin graft. The secondary reconstruction has been carried out in 2 stages. The tarsoconjunctival flap was divided on the 7th day after it was fashioned. (e) Final result 3 months after the secondary reconstruction.

Results

Of the 11 lesions submitted for histology 8 were rodent ulcers, 1 squamous carcinoma, 1 melanoma, and 1 acanthoma with solar keratosis. Histological study confirmed complete tumour clearance in all cases. The eyelid wounds appeared to have healed completely in about 6 weeks, though the cosmetic appearance continued to improve over a further 6–8 weeks. No patient had any of the possible complications of sepsis, secondary haemorrhage, nonhealing, or delayed healing of the wound, ocular irritation, exposure keratopathy, epiphora, trichiasis, entropion, symblepharon, or loss of eyelid due to failure of healing. One patient (case 3) developed ectropion that was corrected by a small full-thickness skin graft as a secondary procedure. The ectropion in this case was due to cicatricial tug resulting from parpalpebral fibrotic healing after extensive resection of adjacent skin and orbicularis.

In common with the results obtained after surgical reconstructions the newly formed portion of the eyelid was devoid of eyelashes. The lower fornix was adequately formed (except in 1 case with excision of almost the entire lower eyelid). On slit-lamp examination the inner lamina of the newly formed eyelid appeared to be regenerated conjunctiva, as it was

virtually indistinguishable from the remaining original conjunctiva. The skin lamina of the new eyelid was also indistinguishable from the surrounding skin. The middle layer of the newly formed portion of the eyelid was of comparable stiffness to that of the adjacent original eyelid. The cosmetic results of spontaneous healing (Tables 1 and 2) were excellent in 8 patients, just about acceptable in 1, and poor in 2 patients, but in neither was it worse than the very poor preoperative cosmetic appearance. Except in these 2 patients spontaneous repair yielded a consistently stable lid margin. Like the results obtained after most surgical reconstructions of full-thickness lower eyelid, the spontaneously reformed eyelids in the 9 patients also showed some retraction. This was minimal and not readily observable.

Discussion

This report is the first planned study of spontaneous repair of lower eyelids that have been resected in full thickness including the lid margin. After full-thickness excision of the whole or part of the lower eyelid restoration of its integrity, though not essential, is desirable almost entirely for cosmetic rather than functional considerations. In the

traditional practice of oculoplastic surgery immediate repair after such excisions is considered obligatory. Defects up to one-third of the horizontal extent of the eyelid are usually sutured directly in multilayers—if necessary, with canthotomy or cantholysis. The reconstruction of larger defects is implemented in at least 2 layers by transposing mucosa and skin from adjacent or remote donor sites.²⁻⁷

Brown and Fryer⁸ appear to have been the first to consider natural healing as an alternative to immediate surgical repair of an excised lower eyelid. They thought: 'Surgical excision and immediate repair are desirable if local tissue is available. In other cases, the need for secondary reconstruction is sometimes reduced or avoided altogether by waiting for spontaneous reconstitution'. They advocated natural healing only after excision of 'large carcinoma', where immediate surgical reconstruction is likely to prove difficult. However, their generalisation appears to have been based on their experience with the solitary case that they report. My results show that it is the smaller lesion needing full-thickness excision of up to half the lower eyelid that yields almost normal cosmesis and is therefore eminently suitable for spontaneous repair. For larger excisions involving half to two-thirds of the eyelid I agree with Brown and Fryer that spontaneous repair reduces the magnitude of the secondary surgical reconstruction. But the disadvantage then is that the patient needs to undergo 2 periods of convalescence. Subsequent reports of spontaneous repair are by Fox and Beard⁹ and Mehta.¹

Apart from the difference that all 6 cases reported by Fox and Beard⁹ were at the medial canthus, and that only their case 3 was managed by simple excision and simple spontaneous repair (their remaining 5 cases had various ancillary procedures like suturing of the conjunctiva to form a medial cul de sac, suturing of the upper eyelid to the lower, fashioning of local skin flaps, etc.) there is also a significant conceptual difference between us. This is best highlighted by quoting Fox and Beard⁹: '... all six cases reported here were at the canthus, that is, away from the central areas of lid margins... a lesion in the centre of the lid, with healthy lid margin on each side can not be left to chance. Repair is mandatory, and unless undertaken will end up in notching, cicatricial entropion or ectropion or loss of the lid'.

The results obtained in my cases do not bear this out. They indicate that full-thickness excision of up to half of intercanthal portion of the eyelid yields nearly normal results even if allowed to heal naturally. As none of my cases reported here needed excision involving the lateral canthus, I do

not have evidence to corroborate my belief that even such excisions, if allowed to heal naturally, are likely to yield acceptable results. For obvious reasons I have not carried out histological study of the spontaneously reformed eyelid. On clinical observation it appears that the lower eyelid is not truly epimorphic but has the potential of partial regeneration, as the conjunctiva and the skin lamina appear to regenerate. The middle lamina is probably formed by fibrous tissue rather than by regeneration of the tarsus.

Apart from demonstrating the feasibility of spontaneous reformation of margin-including full-thickness resections of lower eyelid, this study shows that even if left 'open' without any dressings such wounds heal normally in about 6 weeks. The cartella shield in these patients was used merely to prevent accidental mechanical molestation of the vulnerable fragile fronds of granulation tissue. The improvised central hole in the shield obviated visual obstruction. Conventionally such wounds are managed with dressings of tulle gras and pad and pressure bandage, which demand expert nursing attention, are inconvenient to the patient, and are more expensive. In these 11 patients the application of the antibiotic ointment and reapplication of the same cartella shield was carried out by the patients themselves or their relatives. This, coupled with the patients' having been treated as day cases, resulted in significant savings in the cost of materials and manpower. It appears that the petroleum jelly base of the antibiotic ointment aided by natural lacrimal secretion prevented desiccation of the wound. Encouraged by the results of spontaneous repair in these 11 patients I have since used the method in the primary management of patients with atonic ectropion and trichiasis of lower eyelid. Satisfactory results have been obtained and will be the subject for a separate report.

It is surprising that none of the 11 patients reported here was concerned about the cosmetic outcome, though all were anxious to have complete removal of the tumour. As some of the surgical procedures for reconstruction of the lower eyelid are extensive and possibly multistage procedures that leave noticeable scars, I believe that it is unreasonable to subject *all* patients to such surgery to achieve results about which the patients themselves may be indifferent. It is even more unreasonable if the surgery is undertaken predominantly to gratify the aesthetic sensibility of the surgeon. The potentially invasive nature of malignant tumours affecting the lower eyelid *does* make their treatment imperative. The potential of satisfactory spontaneous repair of full-thickness excisions of up to half of the lower eyelid renders their primary surgical reconstruction optional.

Conclusion

Immediate surgical reconstruction after full-thickness excision of the lower eyelid is not always necessary. Natural healing provides a simple, quick, effective, cheap, convenient, and practicable alternative if the excision involves up to half of the lower eyelid. The excision can be completed within 10 minutes under local anaesthesia on day-case basis. Neither pressure dressing nor occlusion of the eye is necessary. The patient can resume normal activity immediately after the excision. It saves the surgeon's time and effort and can be performed by a junior colleague. Best results are obtained in younger patients, and for excisions involving the medial half of the lower lid—a fortunate circumstance, as surgical repairs here are among the most difficult. Though one cannot always be entirely certain of a favourable outcome of spontaneous repair in all patients, it deserves to be offered as an option to them, especially as it does not preclude a subsequent surgical reconstruction if necessary.

This study was supported in part by a grant from the Welsh scheme for the development of health and social research.

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