Late reoperations for squint

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SUMMARY Ten patients in the age range 2 to 22 years are described who had operations initially for squint in childhood. Nine had had concomitant convergent strabismus and one divergent. All presented again in adult life with a cosmetic complaint, but two also had diplopia. Reoperations were done, age range 14 to 43. These ten were all the 'late reoperations' for squint which were done during the four year period 1972 to 1976 by one consultant (C.I.P.).

Technically these late reoperations were not difficult, though the amount of change predictable in position of the eyeball could be only approximate. Recession $\pm$ advancement $\pm$ resection of horizontal recti were done in all cases. In one case no medial rectus was identified attached to the eyeball; a mass of tissue behind the caruncle was mobilised and sutured to the globe with resultant good movement. To avoid tethering of the eye by scarred conjunctiva, vertical conjunctival incisions were often converted at suturing to — or — shaped wounds.

The absence of any new cases of diplopia (the two who had it preoperatively retained it without aggravation) is attributed to the fact that all cases were under-corrected, i.e., no convergent or divergent squint was converted into a divergent or convergent squint respectively, so that the non-corresponding image remained within the area of suppression, which probably extends only to the vertical meridian in a squinting eye.

Although there is considerable information about initial surgery for cases of strabismus and its results, surprisingly little seems to have been written about the problem of reoperation in adult life to correct those squints which have followed operations performed usually many years previously (Jampolsky, 1975). In the last 4 years 10 such cases have been operated on successfully; the result of this group is presented partly to encourage the publication of larger series which would help clinicians to formulate clinical judgment especially regarding operation. (We have excluded cases of secondary squint *not* operated on because of the difficulty in tracing their records: the decision against operation was based primarily on the absence of sufficient cosmetic disability, often related to the fact that they occurred in the elderly.)

From previous experience we had reached the

tentative conclusion that the risk of diplopia following late reoperations is much less than perhaps tradition has suggested, and this conclusion is confirmed.

Material and methods

The 10 patients came from one consultant's 'routine' ophthalmic clinics held twice weekly in this hospital between 1 October 1972 and 1 April 1976. All had been referred by their general practitioners (to whom some had been sent by their opticians) with one exception, who was referred by a psychiatrist. Most came from Edinburgh or nearby towns. The preoperative details are shown in the Table and also the operations which were done.

Though measurements from limbus were used as an orientating base-line at operation, the amount of recessions and resections shown in the Table are from site of insertion actually found at operation. To conserve as much functioning muscle as possible whip sutures were inserted, in the case of (re) recessions or advancements, at the extreme anterior end

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Serial no.	Sex	Details of initial operation(s)				Details of reoperation	
		Diagnosis	Age (years)	Operation(s) done	Presenting complaint	Age (years)	Diagnosis
1	F	LCCS	11	RMR recession RLR resection LMR recession LLR resection	Cosmetic	43	LCCS/ACCS FR +16° R/L 10Δ FL +17° R/L 10Δ
2	M	LDS	22	LLR recession LMR resection	Cosmetic	29	Moderate LDS -20° (L high myopia and open-angle glaucoma)
3	F	LCCS	13	LMR recession ? LLR resection ?	Cosmetic	29	LDS -16° with L eccentric fixation
4	F	RCCS	8	RMR recession RLR resection	Cosmetic	23	RDS FR -15° L/R 2Δ FL -16° L/R 4Δ
5	F	LCCS	6	LMR Tenotomy Advancement of LLR	Cosmetic	21	LDS -30° L/R 12Δ with eccentric fixation
6	M	LCCS	2½	LMR recession LLR resection	Cosmetic	20	LDS -15°
7	F	LCCS	4/5	LMR recession ? LLR resection	(a) Diplopia, looking down (b) Cosmetic	19	LCCS FR +13° L/R 1Δ FL +13° with vertical diplopia
8	F	RCCS	2	RMR recession	(a) Diplopia (b) Cosmetic	14	RDS -20°
9	M	LCCS	4 8 9	LMR recession and LLR advancement 'Correction of LDS' Recession of each LR	Cosmetic	17	LDS/ADS -25°
10	F	ACCS	18	RLR recession RLR resection	Cosmetic	39	ACCS FR +35° L/R 2Δ FL +35°

of the muscle (often along with a central suture); in resections the extreme edge was also used, and at least one supplementary central suture was inserted.

In general in recessions of medial recti Dacron sutures were used, while resections of medial recti and all operations on lateral recti had 6/0 chromic catgut sutures.

Results

These are shown in the Table. The results were recorded between one and three years after the reoperation.

Discussion

INDICATION FOR OPERATION

Several patients had postponed attending their own general practitioner for several years through shyness and were relieved to find sympathy for their cosmetic problems and a willingness to operate again. As occurs in other cosmetic problems, patients are often diffident about admitting embarrassment from cosmetic defects, which it may well be wise to elicit by a leading question. Each was warned that there was a risk of postoperative diplopia but that it was not great and was worth taking for the highly probable cosmetic benefit.

Patients were always warned that an ideal result was not guaranteed and that a further operation might be necessary, because the amount of change in position of the globe was difficult to predict from interference with previously operated muscle, and that an aim was usually slight undercorrection to minimise the risk of diplopia (and because even a slight overcorrection might be cosmetically unacceptable to a patient and his society who had become accustomed to the existing cosmetic defect).

OPERATION

A *provisional* decision was made preoperatively about the amount of recession and/or advancement to be done on the basis of the type of squint and initial operation presumed or known to have been present or done in childhood. That decision was always modified if necessary by the actual findings at operation.

Technically the operations themselves were not difficult—hardly more so, if at all, than initial squint operations. Even greater care than usual was taken to prevent perforation of the globe, especially when a heavily scarred muscle with adhesions extending posteriorly was mobilised. Tenon's capsule was usually represented by rather thin scar tissue easily separated from muscles. Thinned conjunctiva often overlay operated muscles, and in order to prevent

7A

RE	LE	Reoperation (measurement from site of insertion found)	Postoperative diplopia	Remarks
i/6	6/60	LMR recessed by 5 mm	None	Cosmetically good FR +4° R/L 7Δ FL +4° R/L 5Δ
i/6	No PL	LLR recessed by 5 mm	None	Cosmetically very good LDS -4°
i/6	6/60	LMR not found. Tissue behind the caruncle mobilised and attached to sclera 7 mm behind limbus	None	Cosmetically very good; adduction possible: L eye can look straight ahead, but rest position -5°
i/6	6/6	RLR recessed by 8 mm	None	Excellent cosmetically RDS -5°
i/6	CF	LLR recessed by 5.5 with L Inf R resection 5 mm	None	Cosmetically very good LDS -4° and L/R 2Δ
i/6	6/60	LLR rectus recessed by 9 mm	None	Cosmetically very good LDS -5° to -10°
i/6	6/12	LMR further recessed by 3 mm LLR resection 3 mm	As before the operation	Cosmetically very good LCS +4°
5/24	6/6	RMR resection 3 mm with advancement to original insertion RLR recessed by 6.5 mm	Present but in six months patient learned to ignore it	Cosmetically very good RDS -5°
i/6	6/6	LLR recession: 7 mm LMR resection 7 mm with advancement to original insertion. Two epithelial implantation cysts removed	None	Cosmetically excellent LDS -5° to -10°
i/6	6/6	LMR recession 6.5 mm LLR resection 7 mm	None	Good ACCS +6°

tethering of the eyeball by conjunctiva on the side of a recession, the vertical or curved conjunctival incision, made far behind the limbus, was converted into —, the horizontal part pointing posteriorly. Interrupted catgut (6/0 plain) sutures were used for all conjunctival incisions as in all cases of squint operated in this unit, to prevent 'granulations'. A search was always made superiorly and inferiorly, superficially and deep for stray muscle fibres.

In all cases the squinting eye (or maximally squinting eye in alternators) was operated on, though Folk (1973) has suggested that the previously unoperated eye is preferable because the amount of effect of operation is more predictable.

One patient was of particular interest (No. 3). No sign of even a remnant of medial rectus could be found attached to the eyeball. A search was made behind the caruncle as advised by Lyle (1952). Although no muscle was actually identified, the 'wedge' of tissue behind the caruncle was mobilised and (re) attached to the globe with resulting good movement—which confirmed the presence of muscle, with an insertion presumably not far behind the level of the caruncle.

Postoperative diplopia is the greatest cause of anxiety in these late reoperations. However, our clinical impression is that it is less common than is usually feared. *The only two cases in this series also*

had diplopia before this late reoperation. This may be the result of our deliberate policy of (slight) undercorrection of the squint, i.e., to avoid shifting the image of the squinting eye across its vertical meridian (see Posner and Schlossman, 1951). If that is a valid principle and explanation for the avoidance of postoperative diplopia, the reason may be that half the retina with the aberrant image may be suppressed (hemiretinal suppression, Jampolsky, 1955). Similarly a horizontally oval area of suppressed retina may well be unlikely to extend (far) across the vertical meridian of the retina (Jampolsky, 1955).

CAUSES OF CONSECUTIVE SQUINTS

Most cases have a simple explanation, at least superficially, namely, too small or too large an amount of recession or resection at the first operation to make the visual axes straight (for distance). Some cases, however, seem to have been adequately corrected at the first operation in early childhood, so that presumably the absence of binocular vision allowed whatever small residual angle of squint may have remained after initial operation to increase gradually in subsequent years. It is surprising that a very small divergent squint resulting in childhood from operation for a convergent squint does not 'startle' the central nervous system by diplopia into

recovery of binocularity. This failure may be due to too large an overcorrection which cannot be overcome, or more often too long an absence of binocular vision before initial operation, though Taylor's (1973) remarkably good results of operation up to two and a half years of age in congenital squints would not support that latter suggestion.

Although our postoperative results observed from 1 to 3 years afterwards are very satisfactory, it may be that over future years an increase in the deviation may occur with a need to consider another reoperation.

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