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Combined Periciliary Y-V Epicanthoplasty and Modified Hotz Procedure in Patients with Down Syndrome

Dear Editor,

Epiblepharon is a common condition among Asian children, and its incidence is much higher in Down syndrome patients than in non-Down syndrome patients [1]. Moreover, natural remission of upper and lower eyelid epiblepharon rarely occurs in the case of Down syndrome patients, in contrast to its natural course in other patients [2,3]. Thus, almost all Down syndrome patients with epiblepharon require surgical correction of upper and lower eyelid epiblepharon. In this study, we performed periciliary Y-V epicanthoplasty, modified Hotz procedure, and the double-eyelid procedure simultaneously. This work was carried out in accordance with the Declaration of Helsinki.

Patients with Down syndrome and upper and lower epiblepharon were enrolled. All surgeries were performed under general anesthesia by the same surgeon. Periciliary Y-V epicanthoplasty was performed first and the detailed methods were described previously [4]. Periciliary Y-V epicanthoplasty can reduce hypertrophic scar formation on the very thin skin of the periciliary area.

In this combined surgery, we performed the modified Hotz procedure on the lower lid through the epicanthoplasty incision (Fig. 1A-1D) [4]. While the nasal skin was pulled medially and released completely, a and a' were marked. Then, b and c points were marked on a midpupillary line. Point d was marked on the extended line of c for

the modified Hotz procedure. The incision lines should be within 1 mm of the ciliary lines and the skin-mucosal junctions [4]. The incision for the double-eyelid procedure was made separately 5 to 6 mm from the cilia line. The medial part of this line could be modified, because periciliary sutures during epicanthoplasty might shorten the width of the double-eyelid line. After a careful undermining procedure, the triangular flaps aa'b and aa'c were excised and discarded. From the lateral portion of the lower punctum to point d, dissection was performed between the orbicularis muscle and the tarsus to expose the anterior surface of the tarsal plate, and the pretarsal orbicularis muscle beneath the lower edge of the skin incision was excised [3]. A key suture approximating point a to a' was done using 6-0 absorbable suture. The subcutaneous tissue of the incised skin at the upper edge of the lower eyelid was fixed to the lower margin of the tarsus with 2 to 3 interrupted sutures of 6-0 absorbable suture and a similar procedure was done on the upper lid. All skin was sutured with 6-0 absorbable suture.

The combined procedure was performed on four patients aged 6 to 10 years (mean, 8 years). The follow-up period ranged from 6 to 12 months (mean, 10 months). The preoperative interepicanthal distance (IED) was 34 to 36 mm (mean, 34.75) and the postoperative IED was 29 to 31 mm (mean, 29.75). The IED decreased statistically significantly postoperative ($p = 0.046$, Wilcoxon signed rank test) and there was no recurrence during the follow-up period. Fig. 1E-1H shows the pre and postoperative status of a 6-year-old boy. All parents were satisfied with the aesthetic results of the procedure. There was little scar formation, infection or other postoperative complications.

The modified Hotz procedure is the most commonly performed epiblepharon repair procedure [5]. However, medial undercorrection and high recurrence rate result in a poor surgical prognosis, especially in patients with Down syndrome. This outcome is partially due to the presence of prominent epicanthal folds in those with Down syndrome.

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Fig. 1. (A) Incision mapping on the periciliary area and double-eyelid procedure. (B) Resection of the triangular flap (a-a'-c). (C) Dissection between the orbicularis muscle and the tarsus to expose the anterior surface of the tarsal plate of the upper and lower lid. (D) Final V-shaped appearance of the periciliary area and formation of the upper eyelid crease (modified from Lee YJ, et al. *Ann Plast Surg* 2006;56:274-8) [4]. (E) Preoperative photograph showing a long interepicanthal distance and cilia touching the cornea. (F) Photograph obtained 3 months postoperative showing no cilia touching the cornea and cosmetic enhancement. (G) Preoperative photograph showing a long interepicanthal distance (36 mm). (H) Immediate postoperative photograph showing decreased interepicanthal distance (31 mm).

In Down syndrome, the telecanthus can also be corrected by periciliary Y-V epicanthoplasty, which is a simple and safe method [4]. To our knowledge, this is the first report on a combined surgery using the modified Hotz procedure via the lower lid incision of periciliary Y-V epicanthoplasty. This method has several benefits. First, it can simplify the procedure, without additional incisions for the Hotz procedure. Second, because the Hotz procedure was performed through the periciliary Y-V epicanthoplasty inci-

sion within 1 mm of the skin-mucosal junction, hypertrophic scar formation can be minimized. Therefore, simultaneous modified Hotz procedure, periciliary Y-V epicanthoplasty, and double-eyelid procedure is an efficient method to correct congenital palpebral anomalies in patients with Down syndrome. In addition, combined surgery is recommended because most procedures in children need to be performed under general anesthesia.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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