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Structural and cosmetic outcomes of medial epicanthoplasty: An outcome study of three different techniques[☆]

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Summary *Aim:* The authors intended to evaluate the structural and cosmetic outcomes of medial epicanthoplasty.

Methods: Medical records and photographs of 92 eyes from 46 Korean patients who underwent medial epicanthoplasty were reviewed retrospectively. The patients underwent epicanthoplasty using root Z-plasty, Y–V plasty, Mustarde's technique, and modified one-armed Mustarde's technique, from January 2009 to August 2011. Postoperative changes in the horizontal fissure width were measured for the assessment of structural outcome. The cosmetic outcomes were assessed in terms of appearance, symmetry, and scarring using a three-point grading system. Postoperative outcomes were evaluated at 1, 3, and 6 months after surgery.

Results: Root Z-plasty, Y–V plasty, and Mustarde's method (including Mustarde's technique and modified one-armed Mustarde's technique combined) with medial canthopexy were performed on 64, 13, and 15 eyes, respectively. Six months after surgery, the horizontal fissure width increased by an average of 1.74 (8.4%), 1.64 (8.9%), and 1.89 mm (12.9%), respectively ($p < 0.001$, 0.041, and 0.027). In addition, root Z-plasty had a higher postoperative appearance grade than Y–V plasty and Mustarde's method ($p < 0.001$). Grades of symmetry were good for all methods, and grades of scarring were good for root Z-plasty and fair for the others. Scarring was significantly improved until postoperative 6 months in root Z-plasty and Y–V plasty ($p < 0.001$ and $p = 0.022$, respectively).

[☆] Meeting: This study has been presented as a free paper at the 27th APAO (Asia Pacific Academy of Ophthalmology) Congress, Busan, South Korea, 15 April 2012.

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Conclusions: Medial epicanthoplasty increased the horizontal fissure width of about 1.7 mm. Most cosmetic outcomes were satisfactory, with root Z-plasty resulting in excellent outcomes. Scarring faded over time.

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Introduction

Typical Asian upper eyelids are characterized by the lack of a superior palpebral fold, laxity of pretarsal skin, excessive fat, and a prominent medial epicanthal fold, also known as a Mongolian fold.^{1,2} An epicanthal fold may diminish the beauty of the eyes, covering the medial canthus and lacrimal lake, and it may visually cause a shorter palpebral fissure, increasing the distance between the medial canthi of the eyes.^{3–5} Therefore, cosmetic surgery of the Asian eyelids has focused on the formation of pretarsal folds, the removal of excessive skin and fat, and the modification of medial epicanthal folds.

There are many surgical methods for medial epicanthoplasty, such as Mustarde's four-flap technique and modifications,^{6,7} V–W plasty,⁸ V–Y advancement flap,⁹ modified Y–V advancement flap,^{10,11} and Z-plasty and modifications.^{2,12–16} However, there are few studies comparing these different techniques.⁵ The aim of this study was to present our surgical experiences and compare postoperative outcomes from different types of medial epicanthoplasties: root Z-plasty, Y–V plasty, Mustarde's technique, and modified one-armed Mustarde's technique. We evaluated postoperative outcomes chronologically and with respect to both structural and cosmetic aspects.

Patients and methods

Local institutional review board (IRB)/ethics committee approval was obtained for this study. The study adhered to the tenets of the Declaration of Helsinki, and written informed consent was obtained from all the participants (parents or legal guardians).

Electrical medical records and photographs of 46 Korean patients with an epicanthal fold were reviewed retrospectively. The patients underwent medial epicanthoplasty performed by the same surgeon from January 2009 to December 2011. The epicanthal folds were classified into four types: epicanthus supraciliaris, epicanthus palpebralis, epicanthus tarsalis, and epicanthus inversus ([Supplementary Figure 1](#)), according to Duke-Elder's classification.^{17,18} Patients with anophthalmos, a previous history of medial epicanthoplasty, unilateral surgery, or follow-up time <6 months were excluded from this study.

Surgical techniques

Surgery was performed under general or local anesthesia, and additional local anesthetic agents were not used in cases performed under general anesthesia. The surgical

methods were based on the type and severity of the epicanthal fold. Most of the eyes with epicanthus tarsalis underwent root Z-plasty, and Y–V plasty was primarily performed on eyes with epicanthus palpebralis and epicanthus tarsalis. In cases of epicanthus inversus, Mustarde's technique or modified one-armed Mustarde's technique with medial canthopexy was used. Refer to [Supplementary Figure 2](#), which demonstrates the surgical procedures in this study.

Root Z-plasty

Root Z-epicanthoplasty was performed as previously described.¹⁶ The incision line was drawn along the edge of the epicanthal fold, and it was consistent with the supratarsal fold in cases with simultaneous upper eyelid surgery. A horizontal line at the level of the medial canthus to a representative point of the medial-most region of the lacrimal lake was also marked. After pulling the skin medially to uncover the medial canthus, a curvilinear line was marked to the medial-most area of the lacrimal lake. Incisions were made using a surgical blade, and by careful dissection a flap was made. Fibrous tissue and muscle underlying the skin were released. The flaps were transposed without tension, and sutures were made using a 6/0 nonabsorbable polypropylene suture.

Y–V plasty

A small Y-shaped design was drawn by marking the incision line along the edge of the epicanthal fold horizontally from the medial canthus to the desired point of medial canthus. After the incision was made along the line, the subcutaneous tissue and the orbicularis oculi muscle were dissected and released. Redundant skin was excised, and the wound was repaired using a 6/0 nonabsorbable polypropylene suture. Medial canthal ligament plication could be combined in severe cases, but these cases were excluded from this study because only two cases with blepharophimosis required the correction of telecanthus.

Mustarde's or modified one-armed Mustarde's technique with medial canthopexy

Mustarde's four-flap technique or the one-armed modification with medial canthopexy was performed in cases with severe epicanthal folds or epicanthus inversus.^{6,7} The incision line was designed for four flaps as described by Mustarde⁶ or for inferior one-armed flaps as introduced by Yoon.⁷ The skin was incised, and dissection was carefully performed for flaps to be movable without tension and for the medial canthal ligament to be exposed. Medial canthopexy was performed with a deep, buried suture using a double-armed 5/0 nonabsorbable braided polyester suture

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