Journal of Plastic, Reconstructive & Aesthetic Surgery (2013) 66, 682–687

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Epicanthal fold correction: Our experience and comparison among three kinds of epicanthoplasties

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Received 2 October 2012; accepted 27 January 2013

KEYWORDS
Epicanthus;
Epicanthoplasty;
Blepharoplasty;
Local flap

Summary Epicanthal fold, which is unique to Asian population, forms a web across and covering the medial canthus. It often impairs the beauty of the eyelids and the outcome of double-eyelid blepharoplasty that is popular in Asians. Although many surgical procedures have been reported, most of them were only description of a single technique. Comparison among techniques will help form universally accepted algorithm or consensus in epicanthus treatment. We want to present our experience of three kinds of epicanthoplasties: horizontal incision method, Z-plasty and V-W plasty and a detailed comparison among these surgical techniques. From 2005 to 2011, the authors had performed epicanthoplasties in 252 cases, in which 220 cases simultaneously underwent a double-eyelid surgery. The choice of technique was based on presurgical evaluation of severity of epicanthal fold. Horizontal incision method was used for majority of mild epicanthal fold. Z-plasty mainly applied to moderate cases and V-W plasty was chosen for severe ones. In addition to skin rearrangement in medial canthic region, underlying orbicularis oculi muscle and thick subcutaneous tissue also needed treatment for effective release. The degree of postoperative scarring and epicanthal fold correction were reviewed. All these three methods produced satisfactory long-term results with alleviation of the skinfold and formation of vivid upper eyelid crease. No complete recurrence was observed. Horizontal incision method left an inconspicuous scar and V-W plasty might cause a relatively obvious scar. Persistent hypertrophic scars were observed in 12 patients and gradually faded after injection of diprospan. In conclusion, preoperative evaluation of skinfold severity, making a rational choice and careful implementation of surgical technique available are important in effective correction of epicanthal fold.

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1748-6815/$ - see front matter
http://dx.doi.org/10.1016/j.bjps.2013.01.028

Epicanthus is one of the most frequently encountered cosmetic problems in Asian people. It is defined as a semilunar fold of skin extending from the upper or lower eyelid, crossing the medial canthal area and creating a sharp skin ridge similar to a web formation. Epicanthal fold covers medial canthus and lacrimal lake to a different extent, visually causing shorter palpebral fissure, widened inner canthic diameter and even pseudo-esotropia.[1,2] Occasionally skinfold that suppresses the medial part of the lower eyelid will cause entropion.[3] If the epicanthal fold was left intact, one of the most popular cosmetic surgeries in Asian population, double-eyelid blepharoplasty,[4] would exaggerate the fold and lead to unnatural looks, impairing the aesthetic outcome of the surgery.

Based on aetiology investigation and experience, numerous surgical techniques were developed to rectify epicanthal folds, including medial canthus skin excision, single or multiple Z-plasty, V-Y advancement and Mustarde's technique, some of which involve complicated designs.[3,5,6] It has been observed that cicatrix of medial canthal region might be obvious when epicanthoplasty is performed on Asian individuals. How to choose a proper surgical technique? Factors that include possible efficacy, simple or complicated design and operation and tendency to cicatrix formation should all be considered. However, until now, most of the publications reported only a description of a single technique without providing a comparison among the different techniques available.

In this article we present our long-term experience of treating epicanthus with three kinds of techniques: horizontal incision method, Z-plasty and V-W plasty and a detailed comparison of these techniques.

Clinical data

From 2005 to 2011, a total of 252 patients with epicanthus were operated on and the details documented; of which, 214 patients were female and 38 patients were male. Patient's age ranged from 17 to 49 years, with an average age of 25.3 years. Our research was approved by the Medical Ethics Committee at Shanghai Ninth People's Hospital.

According to Johnson' classification,[1] the epicanthal folds can be divided into four clinical types: epicanthus supraciliaris, epicanthus palpebralis, epicanthus tarsalis and epicanthus inversus. A majority of our patients, 175 cases, had epicanthus tarsalis with epicanthic fold rising from the upper lid and merging into the skin near the medial canthus (Figure 1A). A total of 58 cases had an epicanthus palpebralis, in which the fold covers the upper and lower lids equally across the medial canthus (Figure 1B). The remaining 19 cases had epicanthus inversus, where the fold rises from the lower lid and ascends into the upper lid over the medial canthus, that is, a condition more often associated with blepharophimosis—ptosis—epicanthus inversus syndrome[7] (Figure 1C). None of patients was diagnosed with epicanthus supraciliaris, in which the fold rises near the eyebrow and runs towards the tear sac. A total of 220 cases underwent the double-eyelid surgery at the same time.

The severity of epicanthus is determined by the covered extent of lacrimal lake and the width of the epicanthal fold (the distance between the edge of the skinfold and the medial-most point of the lacrimal lake): (1) It was mild in 144 cases. Less than half of the lacrimal lake is covered and the width of the epicanthal fold is <2 mm (Figure 2A). (2) It was moderate in 72 cases. More than half but not the whole of the lacrimal lake is covered and the width of the epicanthal fold is 2—4 mm (Figure 2B). (3) It was severe in 36 cases. The lacrimal lake is completely covered by the fold that curves laterally to fuse with the lower eyelid and the width of epicanthal fold is >4 mm (Figure 2C).

Surgical techniques

The choice of technique was based on preoperative evaluation of epicanthal fold severity. Horizontal incision method was used for majority of mild epicanthal fold, Z-plasty mainly applied to moderate cases and V-W plasty was chosen for severe ones (Figure 3).

Horizontal incision method

The point on medial canthal region that is next to the medial-most part of the lacrimal lake is marked as point A (Figure 4A—D). The point B on the epicanthic fold surface perpendicularly represents point A; a horizontal incision between point A and B is made, cutting the skinfold. Following the fold tension release a rhombic-shaped defect forms. The underlying orbicularis oculi muscle fibres are thoroughly divided or even removed until the median canthal tendon becomes visible. Then points A and B are approached with 8/0 black silk sutures to close the rhombic wound, resulting in a longitudinal skin suture line. The subdermal suture with 5/0 or 6/0 polydioxanone suture is necessary to guarantee a good tension-free closure that is the prerequisite for healing with minimal scar tissue formation. If the dog-ear at two ends is obvious, they could be trimmed. Mild skin redundancy does not need treatment and will spontaneously disappear.

Z-plasty

A Z incision is designed taking the epicanthal fold margin as central limb (line segment B—C) (Figure 4E—H). Two triangular skin flaps are raised and transposed, flap ABC carries most of the epicanthic fold of skin and flap BCD mainly contains the medial canthal area skin. Then the two triangular flaps are transposed. With the skin rearrangement obvious alleviation of the epicanthal fold is achieved. The treatment of underlying orbicularis oculi muscle fibres and subdermal suture are similar to the horizontal incision method. Sometimes, proper skin trimming before suture is needed.

V-W plasty

Points A and B are marked on the epicanthic fold margin (Figure 4I—L). Point D locates next to the medial-most part of the lacrimal lake. Point C locates midway between D and line segment A—B. The flap ABC is formed and stretched