



## **The Asian Eyelids and the Role of Asian Blepharoplasty**

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### **ABSTRACT**

Cosmetic surgery and aesthetic dentistry go hand in hand. As dentists, we are trained to analyze aesthetics from the features of the skeletal pattern and dental malocclusion, symmetry of the face, measurement of golden proportions and the features of the smile line. However, several facial ethnic features such as a ‘single eyelid’ may cause a person to be deemed as aesthetically challenged due to Western influence. This article reviews the prevalence of single and double eyelid in Asians and explains why some present with either one or double eyelids. The readers are also introduced to the term “Asian Blepharoplasty”.

Key words: double eyelids, Asian eyelids, single eyelids, blepharoplasty, Asian blepharoplasty

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## INTRODUCTION

“Double eyelids” is the layman’s term used to describe the presence of an upper eyelid crease, which is also known as the supratarsal fold or palpebral fold.<sup>1</sup> This term is used extensively in the Asian continent due to the popularity of double eyelid surgery. Because of Western influence, and perhaps due to the ease to obtain information on the internet, more Asian subjects have been thought to have gone under the knife to convert their single eyelid appearance to a double eyelids appearance.

In the literature, the eyelid is usually classified as either showing the absence or presence of eyelid crease in which the term “single eyelid” (Figure 1) and “double eyelid” (Figure 2a & 2b) are mentioned. Here we review the prevalence of single and double eyelid in Asians, and explain why some Asians are presented with either one or double eyelids.

### Anatomy and aetiology of upper eyelid crease

An upper eyelid crease forms as a result of the presence of one or more fine skin indentation or folds on the upper eyelids that is (are) parallel to the eyelid margin. It is formed by the fibres extending from the levator aponeurosis towards the skin<sup>2</sup> and is best observed on downward gaze or with eye closed (Figure 2b).<sup>3</sup> Such indentation by the levator aponeurosis into the skin and orbicularis muscle causes a surplus of upper eyelid skin above the crease, and gives rise to an eyelid fold that may hang over the eyelid crease<sup>4</sup> (Figure 3a & 3b). This postulation is called the Sayoc’s theory which is generally accepted in the literature as the explanation for this phenomenon.<sup>5</sup> Around 70% of East Asians who lack or have rudimentary distal attachment of the levator aponeurosis towards the orbital skin will present with the absence of lid crease, otherwise known as having a single eyelid (Figure 3c).<sup>6</sup>

There are however, other theories that describe the formation of the upper eyelid crease. Onishi’s theory advocates that the upper eyelid crease is formed by the tight adherence between the tarsal plate and the pretarsal skin, otherwise is loose in subjects without an upper eyelid crease.<sup>5</sup> This theory was supported by Bang *et al.*<sup>5</sup>, where they argued that the upper eyelid crease can be created by performing an Asian Blepharoplasty without supratarsal fixation. On the contrary, Morikawa *et al.*<sup>7</sup> performed a scanning electron microscopic study on 5 Japanese cadaver and reported that terminal fibres of the levator aponeurosis is continuous with collagen fibres in the subcutaneous tissue but none reached the dermis layer as suggested by the Sayoc’s theory.

Jeong *et al.*<sup>8</sup> instead stated that the reason for the lack of an upper eyelid crease among Asians was caused by the 3 following factors:

- 1) Fusion of orbital septum with levator aponeurosis below the superior tarsal border
- 2) Protrusion of preaponeurotic fat and thick subcutaneous fat layer prevents levator fibres from inserting towards the superior tarsal border
- 3) Insertion of levator aponeurosis into the orbicularis muscle and skin occurs nearer to the eyelid margin

Cheng, Xu<sup>2</sup> observed the presence of loose orbicularis muscle in subjects with an upper eyelid crease. They noticed that those without upper eyelid crease had dense stratified orbicularis oculi muscle; hence they postulated that the density of orbicularis muscle would determine the penetration of levator aponeurosis through the muscle to allow fusion with the overlying skin to create an upper eyelid crease.<sup>2</sup> However, Kakizaki *et al.*<sup>9</sup> rejected the association between the levator expansion theory with upper eyelid crease. Their study found that there were levator aponeurosis extensions into the overlying skin irrespective of the presence or absence of an upper eyelid crease.<sup>9</sup> Besides, they observed that all fusion of the orbital septum with the levator aponeurosis occurred superior to the tarsal plate. They postulated that the presence of upper eyelid crease was the result of thinner orbicularis oculi muscle and thinner skin at the upper eyelid crease region.<sup>9</sup>

### **Classification of single eyelids and double eyelids**

Liu, Hsu<sup>10</sup> classified the appearance of the upper eyelid into four categories, namely outer double eyelid, single eyelid, inner double eyelid and unilateral or partially formed eyelid. Outer double eyelid is classically seen among Caucasians, where the eyelid crease is 7 to 10mm from eyelid margin. Single eyelid is presumably seen more often in Asian eyelid where the eyelid crease is absent. The third category is inner double eyelid which has a lower eyelid crease as compared to outer double eyelid with the crease located 3 to 5mm from eyelid margin. The fourth category is a situation where one may have one double eyelid or partially formed crease on one side and another side having a single eyelid.<sup>10</sup>

The shape and location of the crease can also be classified into 6 forms according to Amrith.<sup>6</sup> These six forms constitute of:

- 1) Absence of lid crease
- 2) Typical occidental crease (high crease)
- 3) Inside fold with tapering lid crease (low crease)
- 4) Parallel lid crease
- 5) Multiple creases
- 6) Incomplete crease

Chen<sup>11</sup> gave a similar classification of eyelid crease forms (Figure 4), which are:

- a) Single eyelid without crease
- b) Continuous crease
- c) Segmented or non-continuous crease
- d) Partial or incomplete crease
- e) Multiple creases
- f) Nasally tapered crease
- g) Parallel crease
- h) Typical Caucasian semilunar crease

There is limited literature that published findings on single eyelid. According to Yu, Liao<sup>12</sup>, Chinese subjects with single eyelid can be divided into 6 categories according to their surgical needs of Asian blepharoplasty. These six categories are:

- 1) Eyelid with long and narrow eye
- 2) Eyelid with thin and soft skin
- 3) Eyelid with thick subcutaneous tissue
- 4) Eyelid with small and round eye
- 5) Eyelid with protruding eye
- 6) Eyelid with triangle eye.

### **Prevalence of single and double eyelids**

Generally half of the Asian population have been reported as not having an upper eyelid crease.<sup>4</sup> A summary of the prevalence of upper eyelid crease reported in English literatures is shown in Table 1.

The earliest literature on the prevalence of double eyelids in Asians was recorded in the late 19<sup>th</sup> century as a result of the introduction of Asian Blepharoplasty to Japanese medicine.<sup>1</sup> Mikamo<sup>1</sup> reported the first case of Asian Blepharoplasty on Japanese women, mentioning that 17 to 18 % of his Japanese women patients had single eyelids.

In the following century, there was no literature that reported on the prevalence of the upper eyelid crease in the Asian population. Only in the millennium, a study by Sim, Smith and Chan on the aesthetic facial proportions of Singaporean Chinese women, found that 66.7% of their patients have supratarsal crease.<sup>14</sup> However another study by Chen, Ma, and Liao on Taiwanese women reported a higher prevalence of upper eyelid crease at 83.1%.<sup>15</sup> Although the majority of Chinese in both Singapore and Taiwan originate from the same Southern China root, only Sim, Smith, and Chan<sup>14</sup> specified this in their inclusion criteria; whereas Chen, Ma, and Liao<sup>15</sup> did not specify the origins of their patients that were included in their 2013 study. It has to be borne in mind that 2% of Taiwan's population are Taiwanese Aborigines, hence their inclusion may affect the results in the latter's study. This may partially explain for the higher prevalence of upper eyelid crease in their published research.<sup>16</sup>

Song et al.<sup>17</sup> performed a study on 273 males and 321 females Korean and found that 53.4% of their subjects had an absence of the upper eyelid crease on both eyes, with gender a predilection towards the male population (65.6%). Park *et al.*<sup>18</sup> in their study of 498 Asian subjects found that the prevalence of upper eyelid crease in their study was 30.3% in males and 41.3% in females. They also found that 0.6% of the total sample had triple fold where multiple creases are present as described in the classification mentioned above. Preechawai<sup>19</sup> did a comparison of the orbit and eyelid of four ethnics in Thailand, namely Thai, Chinese, Thai-Malay and Thai-Chinese, and found that the Chinese have a significant lack of upper eyelid crease when compared to other ethnicities. However, prevalence of upper eyelid crease was not mentioned in their study.

All Caucasians are generally perceived to have an upper eyelid crease. Packiriswany, Kumar, and Bashour<sup>20</sup> performed a study on Malaysian Indians who are generally acknowledged to have Caucasoid features, and reported that the prevalence of having an upper eyelid crease present was as high as 99%, which is in agreement with the general presumption. On the contrary, Price *et al.*<sup>13</sup> reported that only 15% of White Caucasians presented with an upper eyelid crease. Therefore, due to this conflicting data, further study is needed to confirm the exact prevalence of upper eyelid crease among Caucasians.

### **Asian Blepharoplasty**

Blepharoplasty is the general term used to describe any procedure that is performed to shape or modify the eyelids. This includes procedures that remove eye bags, fatty protrusion, lax hanging skin around the eyes and ptosis repair. Besides that, blepharoplasty also refers to the creation of lid creases on eyelids which is more famously known as Asian Blepharoplasty<sup>21</sup>.

As stated earlier, about half of the Asian population do not have an upper eyelid crease.<sup>4</sup> The lack of it and the demand to look aesthetically pleasing creates a demand for Asian Blepharoplasty. Currently Asian Blepharoplasty is the most common aesthetic surgery demanded in Asia and is the third most common aesthetic surgery demanded by Asian Americans.<sup>4</sup> The increasing demand for Asian Blepharoplasty is due to the socioeconomic change in Asia in the last decade and the wider acceptance of this surgery among Asians.<sup>22</sup>

Why is it called Asian Blepharoplasty? In geographic context, Asia is the largest continent, extending from the Middle East (in the west) through Central Asia and Indian subcontinent to end at the Far East (which includes China, Korea and Japan). Therefore Asian is a broad term, whereby wide ranges of ethnics are included. However, this term was coined by Chen as being more representative of Asian of Chinese, Korean and Japanese origin rather than the previous term "Oriental Double Eyelid Procedure".<sup>23</sup>

Currently, it is proposed to be named *supratarsal crease surgery* for ease of communication among clinicians and between clinician and patients.<sup>24</sup>

**SUMMARY**

Currently available literatures suggest that Southern Chinese residing in Singapore and Thailand have a high incidence of single eyelids and this finding may be reflective of the Malaysian Chinese too. However, more studies are needed to verify this assumption. Accommodating upper eyelid crease factor in treatment plan of patients would further complement dental practitioners' practice in the provision of aesthetic dentistry.

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**Table 1: The prevalence of upper eyelid crease present in various populations**

Authors	Year	Ethnics	Prevalence of upper eyelid crease (%)
Mikamo <sup>1</sup>	1896	Japanese	82-83 (female)
Sim <i>et al.</i> <sup>14</sup>	2000	Singaporean Chinese	66.7 (female)
Song <i>et al.</i> <sup>17</sup>	2007	Korean	24.1 (male) 45.5 (female)
Park <i>et al.</i> <sup>18</sup>	2008	Asian	30.3 (male) 41.3 (female)
Price <i>et al.</i> <sup>13</sup>	2009	African American	37.0
		Caucasian	15.0
Packiriswamy <i>et al.</i> <sup>20</sup>	2013	South Indian	99.0
Chen <i>et al.</i> <sup>15</sup>	2013	Taiwanese Chinese	83.1 (female)

**FIGURES**



Figure 1. A subject with single eyelid



Figure 2. A subject who has double eyelids, with his eyes opened (top) and closed (bottom)

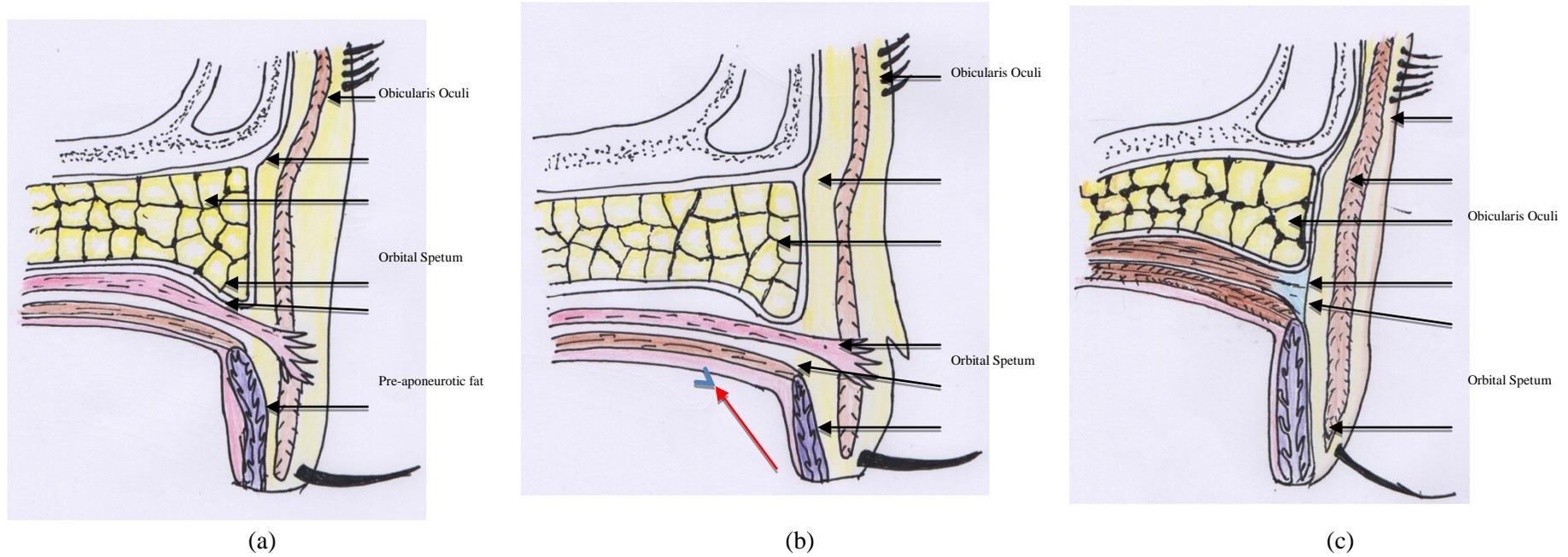


Figure 3: (a) Eyelid with upper eyelid crease showing insertion of levator aponeurosis toward skin and orbicularis oculi muscle.

(b) Invagination of skin by contraction of levator creates fold. (c) Absence of levator aponeurosis into skin and orbicularis muscle.

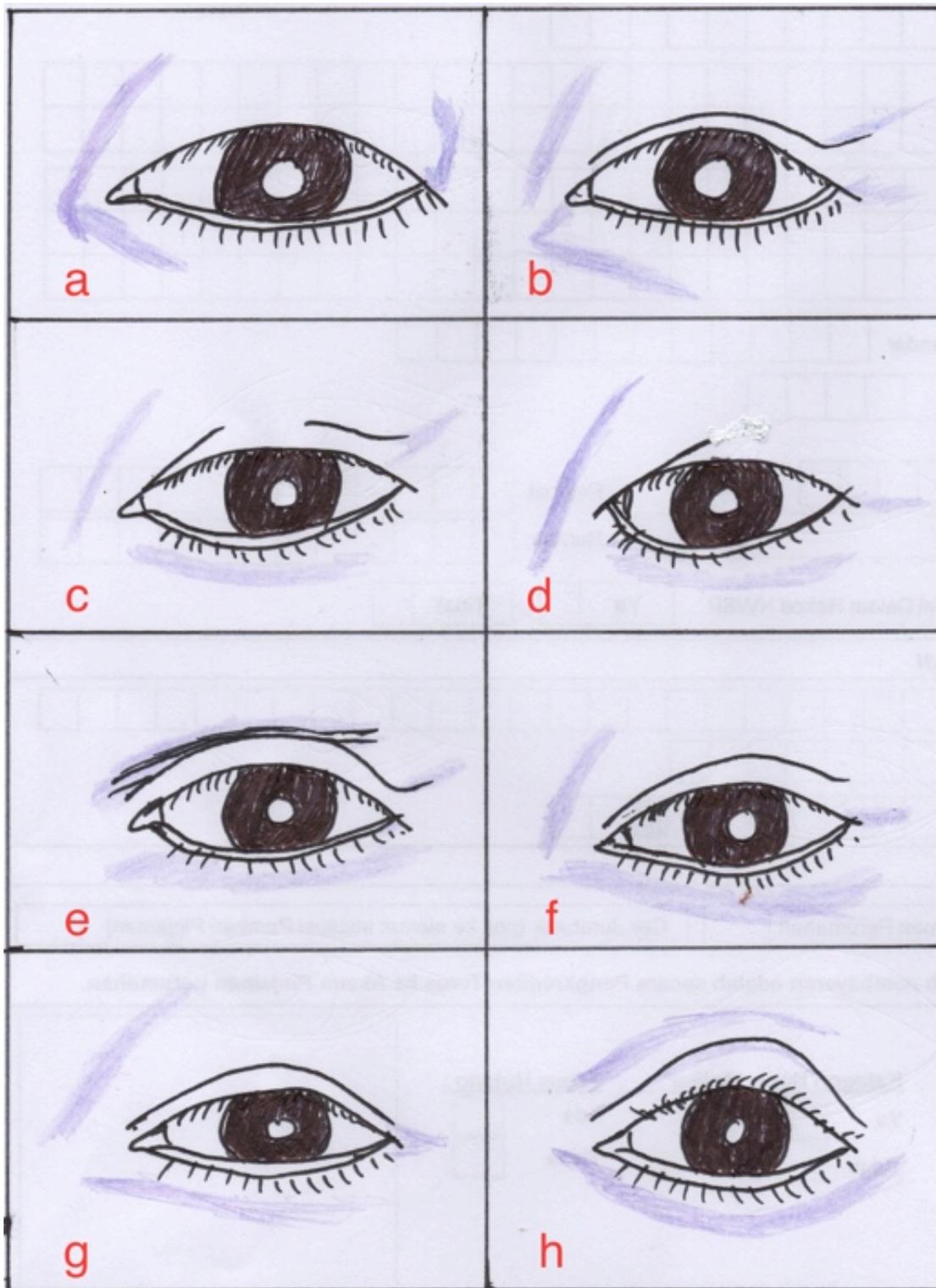


Figure 4: Types of Asian's Eyelid. Redrawn based on the figures shown in: Chen WP-D. *Asian blepharoplasty and the eyelid crease*. 2nd ed. Philadelphia: Butterworth Heinemann/Elsevier; 2006.<sup>10</sup>