

Letters to the Editor

Association between pterygium and plica semilunaris morphology

Ophthalmic pterygium remains an 'enigma' despite numerous proposed pathogenetic theories, such as the molecular genetic alterations of stem cells located at the sclerocorneal limbus.¹ The nasal conjunctiva may be particularly exposed to environmental irritants because of the presence of the 'lacrimal lake' formed in the area of the plica semilunaris.² An oedematous enlargement of the latter may result from chronic ocular surface inflammation.³ A previous study has reported that nasal pterygia are associated with plica semilunaris ectopia, causing 'with-the-rule' corneal astigmatism because of the exertion of tractional forces and thus supported the idea that the ectopia of the plica semilunaris in pterygium is an epiphenomenon rather than a causative association.⁴ Motivated by this finding, we examined the size and location of the plica semilunaris in candidates for primary (non-recurrent) nasal pterygium excision (Pterygium Group, PG) and an age- and gender-matched group of cataract surgery candidates (Control Group, CG) with a view to further evaluate the potential role of the plica semilunaris in the clinical profile of ophthalmic pterygium. Patients with a history of previous ophthalmic surgery or ocular inflammatory conditions were excluded. All patients signed an informed consent in accordance with the tenets of the Declaration of Helsinki.

Measurements included the horizontal diameter of the plica semilunaris (HDPS), that is, the distance from the temporal edge of the plica semilunaris to the temporal edge of the caruncle on a horizontal axis transversing the pupil (Fig. 1a); the plicolimb distance (PLD), that is, the distance between the temporal edge of plica semilunaris and nasal sclerocorneal limbus along a horizontal axis transversing the pupillary plane (Fig. 1a); and pterygium length (PL), that is, the distance from the nasal corneoscleral limbus to the most distal edge of pterygium on the corneal surface (Fig. 1b). Cases with a poorly defined or deformed plica semilunaris were excluded. All measurements were performed on maximal abduction during slit-lamp biomicroscopy by using the slit-lamp distance-measuring tool.

Overall, 64 patients (41 males, 64.06%) and 62 patients (40 males, 64.51%) aged (mean \pm standard deviation, range) 61.32 ± 10.89 years and 63.59 ± 8.92 years were included in the PG and CG, respectively. The HDPS was significantly higher in the PG (5.8 ± 1.1 mm) compared with the CG (3.6 ± 0.8 mm), whereas the PLD was significantly lower in the PG (5.2 ± 0.8 mm) compared with the CG (7.4 ± 1.3 mm) (independent samples *t*-test). In the PG, the PL was 3.1 ± 1.1 mm, and the correlation between PL and HDPS were statistically significant (Pearson's

bivariate correlation coefficient). On the contrary, the correlation between PL and PLD was statistically not significant (Pearson's bivariate correlation coefficient). Moreover, in the PG, the HDPS displayed a statistically significant inverse correlation with the reported duration of pterygium presence and a statistically significant inverse correlation with patients' age, whereas respective correlations with PLD were statistically not significant (Pearson's bivariate correlation coefficient). The significantly lower PLD in the PG, compared with CG, complies with previous reports on temporal ectopia of the plica semilunaris in pterygium, but the fact that PL was not significantly associated with PLD implies that larger pterygia, which should theoretically exert more pronounced tractional forces to the nasal conjunctiva, were not associated with a higher level of temporal ectopia of the plica semilunaris. This finding compromises the hypothesis that temporal ectopia of the plica semilunaris is only secondary to traction by pterygium and points towards a more complex association between plica semilunaris changes and pterygium growth. A hypertrophic plica semilunaris, which is heavily populated with immunocytes, has been previously reported in association with benign reactive lymphoid hyperplasia or accompanying tonsillar enlargement in children.^{4,5} The significantly larger HDPS in the PG may thus reflect an association between the inflammatory activity at the medial conjunctival area and pterygium development. A case of a 5-year-old child with bilateral hypertrophy of the plica semilunaris associated with persistent inflammatory changes at the medial conjunctiva of the left eye is presented in Figure 2. In this case, plica semilunaris enlargement was also evident in the fellow right eye, implying that it may have preceded the inflammatory changes at the medial conjunctiva of the left eye. However, even if pterygium development is indeed affected by inflammatory changes of the plica semilunaris, the potential (although far more rare) development of pterygium on the temporal conjunctival area stresses the multifactorial and complex nature of pterygium pathogenesis. Furthermore, the significant inverse association between HDPS and the reported duration of pterygium presence implies that rapidly growing pterygia are more prone to be associated with plica semilunaris enlargement. Accordingly, the HDPS might be used as an index of the rate of pterygium growth and aggressiveness of its clinical behaviour and could perhaps be taken into consideration for the decision-making, concerning surgical removal, supporting an earlier surgical intervention for potentially more aggressive pterygia associated with an increased HDPS.

The present study suffers from limitations, including the fact that the examiner performing measurements of the size of the plica semilunaris could not be masked against the presence of pterygium, the fact that the progression of

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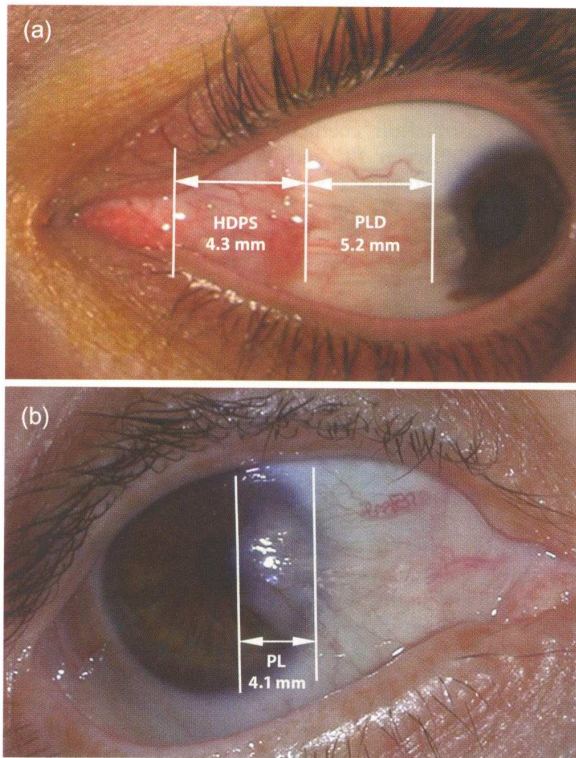


Figure 1. The metrics employed to assess the horizontal width (horizontal diameter of the plica semilunaris [HDPS]) and location (plicolimb distance [PLD]) of the plica semilunaris as well as the corneal advancement of pterygium (pterygium length [PL]) are presented in (a) and (b), respectively.

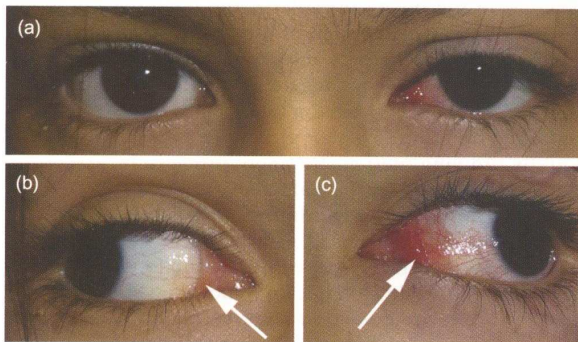


Figure 2. A case of a 5-year-old child with persistent nasal conjunctival inflammation at the left eye, associated with hypertrophy of the plica semilunaris (a,c, white arrow). Interestingly, a hypertrophic plica semilunaris is also noted at the fellow, non-inflamed eye (b, white arrow), implying that the hypertrophy of the plica semilunaris may have preceded the conjunctival inflammatory reaction.

pterygium growth was recorded according to patients' reports and the fact that the size and surface anatomy of the plica as well as the nasal edge of the plica semilunaris (i.e. the border between the plica semilunaris and the caruncle) display considerable variations, which could potentially affect the accuracy of measurements. Accordingly, findings will have to be confirmed by prospective studies that would include patients with pterygium at an early stage of growth and would allow sufficient follow-up time to evaluate a potential association between pterygium growth rate and the size of the plica semilunaris.

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REFERENCES

1. Kwok LS, Coroneo MT. A model for pterygium formation. *Cornea* 1994; **13**: 219–24.
2. Murube J, Chenzhuo L, Murube E, Rivas L, Shalaby O. Measuring the lacunar sulci as a new indicator of shrinkage of the ocular surface. *Eur J Ophthalmol* 2001; **11**: 227–32.
3. Bagheri A, Babsharif B, Yazdani S, Rezaee Kanavi M. Benign reactive lymphoid hyperplasia of the caruncle and plica: report of 5 cases. *Ophthalm Plast Reconstr Surg* 2007; **23**: 473–6.
4. Denion E, Chambaz A, Dalens PH *et al*. Plica semilunaris temporal ectopia: evidence of primary nasal pterygia traction. *Cornea* 2007; **26**: 769–77.
5. Tang J, Rodgers IR, Basham KL, Goh J. Rare case of exuberant benign lymphoid hyperplasia involving the conjunctiva, caruncle, and plica in a child with tonsillar enlargement. *J AAPOS* 2003; **7**: 293–4.

Iris flocculi: elevated intraocular pressure or threat to life?

The article 'Novel grading system for pupillary ruff changes and associated features' by Wong *et al.* in the July 2012 issue of *Clinical & Experimental Ophthalmology*¹ was significant. In this article, the authors suggested that the grading of pupillary ruff atrophy may be helpful in evaluating and managing patients with or without pseudoexfoliation (PXF) syndrome.

It is well documented that PXF is found in many tissues, including throughout the eye, meninges, pericardium,

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