

## CASE REPORT

# Transient Keratoconus following Acute Conjunctivitis

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## ABSTRACT

A 34-year-old female patient presented low visual acuity and vision fluctuation in left eye after a referred acute conjunctivitis. Two previous ophthalmological evaluations diagnosed keratoconus, but the patient disagreed with this diagnosis. Following the patient with an anterior segment tomography and clinical evaluation showed that she had a keratoconus-like topographic and clinical pattern that resolved after a few months of follow-up.

**Keywords:** Keratoconus, Eye rubbing/keratoconus, Inflammatory processes/keratoconus, Corneal topography, Epidemiology/keratoconus.

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## INTRODUCTION

Keratoconus is a primary cornea ectasia commonly related to a genetic predisposition triggered by some recognized risk factors, such as eye rubbing and atopic disease.<sup>1,2</sup>

In some cases, other cornea abnormalities can cause a deformity with a topographic keratoconus-like changes as inferior steepening and high astigmatism, like Rosacea<sup>3,4</sup> and keratoconjunctivitis sicca.<sup>5</sup> Other cause of keratoconus-like topographic pattern is the warpage caused by the long-term use of contact lenses.<sup>6</sup>

We describe a case of a temporary pseudokeratoconus probably caused by eye rubbing, which spontaneously normalized after a few months.

## CASE REPORT

A 34-year-old female was admitted complaining of low visual acuity in left eye, since she had an acute conjunctivitis in both eyes, 3 months ago. She reported little improvement in the visual acuity (VA) after the conjunctivitis, with fluctuation of VA during the day.

She was evaluated by two different ophthalmologists, both one month after the symptom begun, and was diagnosed keratoconus by both. Since she did not have any ophthalmological records before this episode, she decided to seek another ophthalmic evaluation.

On her admission, the uncorrected distance visual acuity (UDVA) was 20/20 in the right eye and 20/100<sup>-2</sup> in the left eye. With a refraction of  $-6.00 = -3.50 \times 170^\circ$  in left eye, she obtained 20/50 of corrected distance visual acuity (CDVA). Both anterior and posterior biomicroscopy were normal and IOP was 12 mm Hg in both eyes.

She brought exams taken at one of the previous evaluations (Figs 1A to C) and a new cornea tomography (Pentacam, Oculus, Germany) was performed (Figs 2A and B).

With all these information and the report from the patient that she rubs her eyes often and sleeps with her arms over the left eye, the possibility of primary ectasia (keratoconus) was discarded and she was told to avoid these habits and come back in 2 weeks.

After 2 weeks, she referred improvement in VA. The UDVA in the left eye improved to 20/60 and the CDVA improved to 20/25 with  $-0.50 = -2.00 \times 110^\circ$ . The patient was scheduled for a new evaluation 2 months after the first visit.

At this new evaluation, she referred a significant improvement in visual acuity and no fluctuation. The UDVA improved to 20/20 with a minimal refractive error (plane =  $-0.50 \times 165^\circ$ ). A new corneal tomography was done showing the resolution of cornea distortion and irregularity (Figs 3A and B). Case evolution is shown in Table 1.

## DISCUSSION

Keratoconus' etiology remains unclear. It is known that genetic and environmental factors are involved.<sup>1</sup> VSX1 (visual system homeobox 1), miR-184 and DOCK9 (dedicator of cytokinesis 9) are so far known implicated gens.<sup>1</sup> Bawazeer et al<sup>2</sup> showed that in the univariate

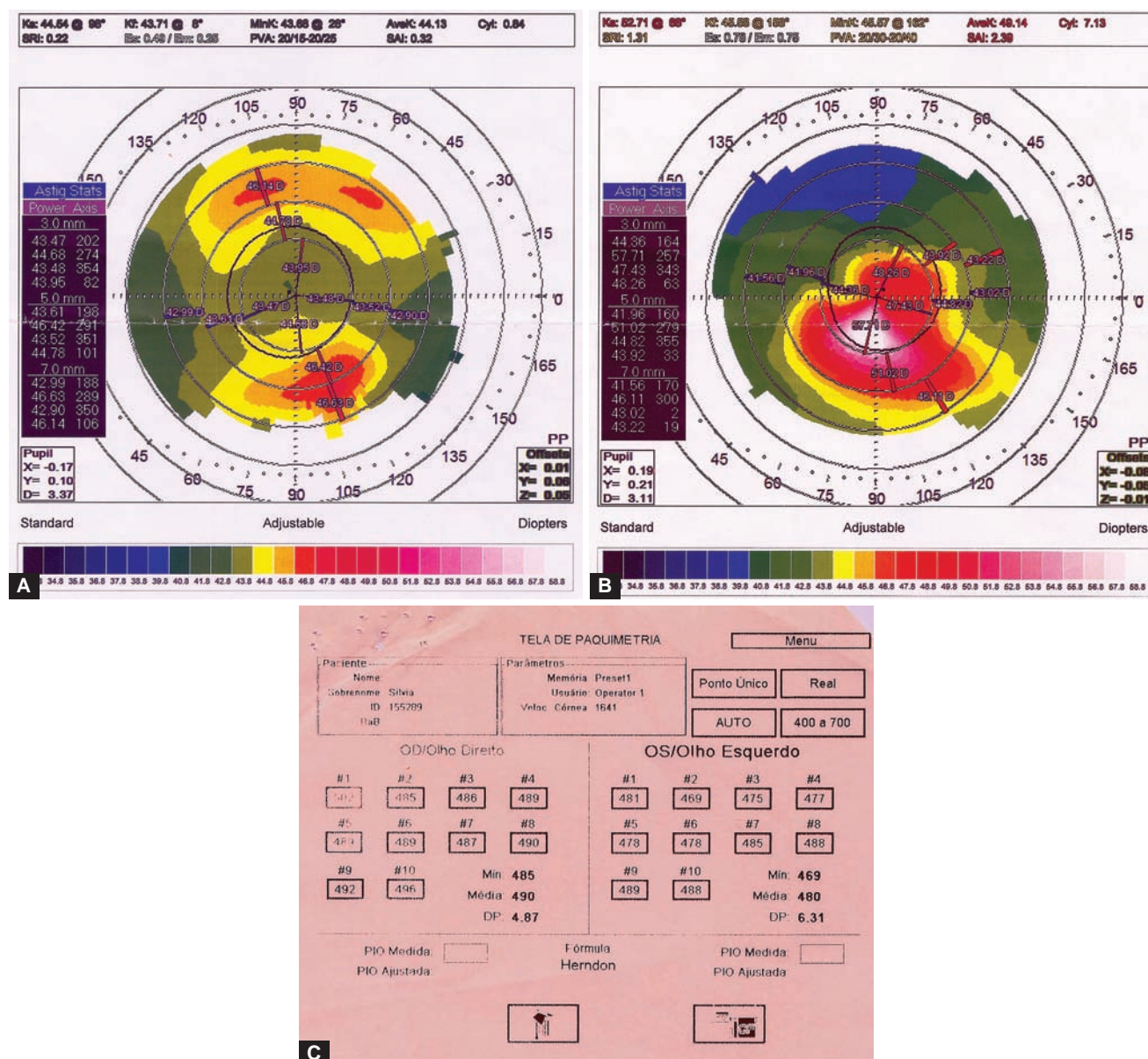
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**Figs 1A to C:** (A) OD topography 07/26/13, (B) OS topography 07/26/13 and (C) OU pachymetry 07/26/13

**Table 1:** Visual acuity, topography and pachymetry evolution

	07/26/2013	09/26/2013	11/28/2013
K1 (D)	45.58	43.7	42.5
K2 (D)	52.71	47.2	43.9
dk (D)	7.13	3.5	1.5
Max K (D)	57.71	48.7	44.1
Mean K (D)	49.14	45.4	43.2
Pachymetry (μ)	469	522	504
UDVA (Snellen)	20/100 <sup>-2</sup>	20/60	20/20
CDVA (Snellen)	20/50	20/25	20/20

UDVA: Uncorrected distance visual acuity; CDVA: Corrected distance visual acuity

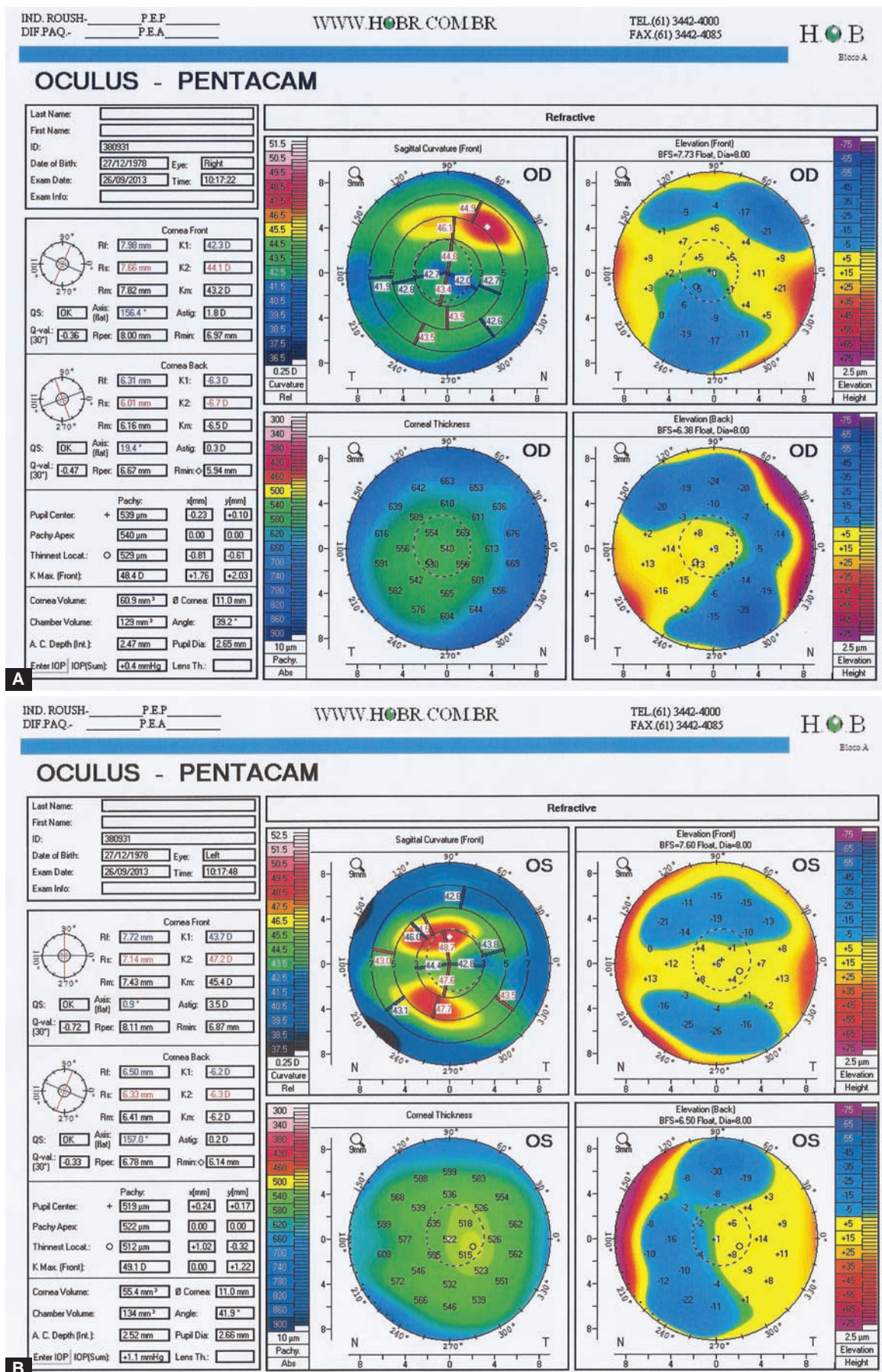
associations, keratoconus had association with atopy, eye rubbing and familiar history. Rubbing of only one eye remained as a risk factor to the development of keratoconus in the multivariate analysis.

Other long-discussed point is the role of inflammation in keratoconus development and progression. Keratoconus

is commonly referred as a noninflammatory ectatic disorder of the cornea. However, some studies had shown the expression of proteolytic enzymes, such as matrix metalloproteinases (MMP), and inflammatory molecules, such as interleukin (IL)-4, -5, -6, -8 and tumor necrosis factor (TNF)- $\alpha$ , - $\beta$  in corneas and tear film of patients with keratoconus.<sup>7</sup>

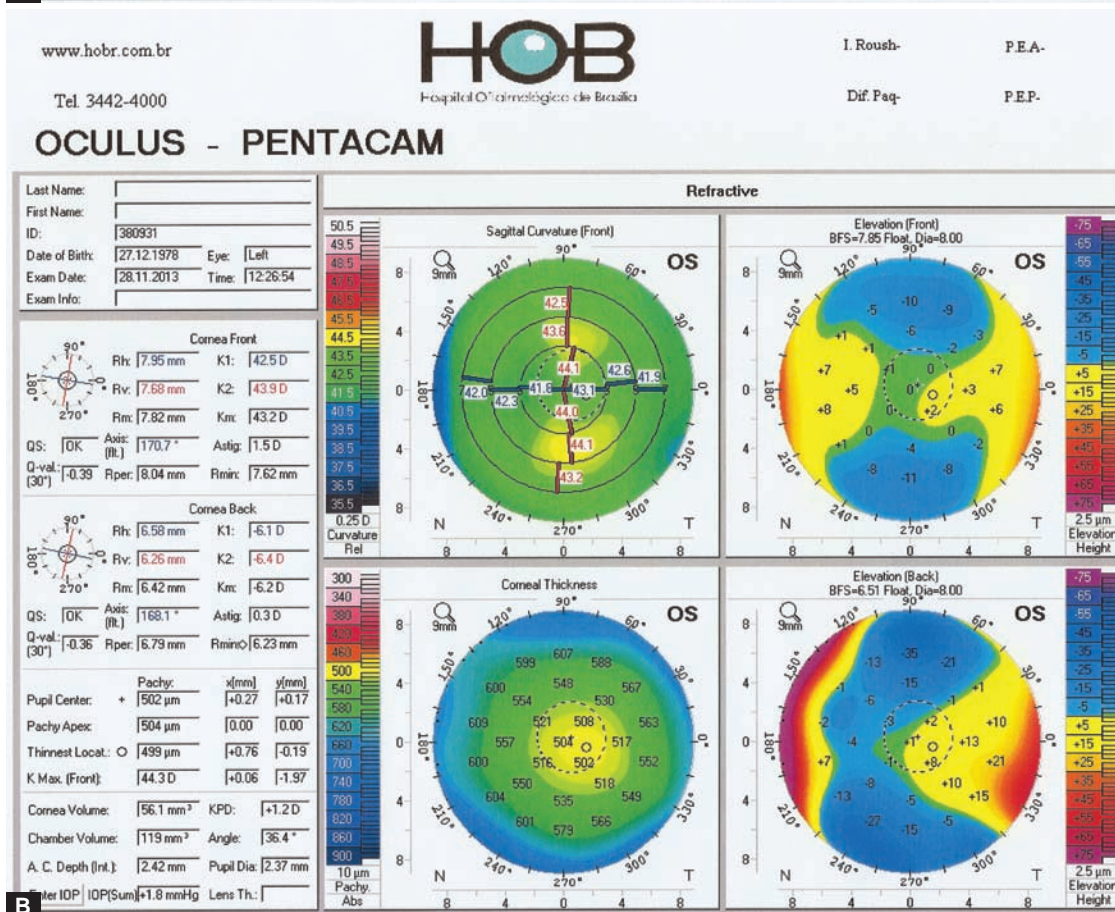
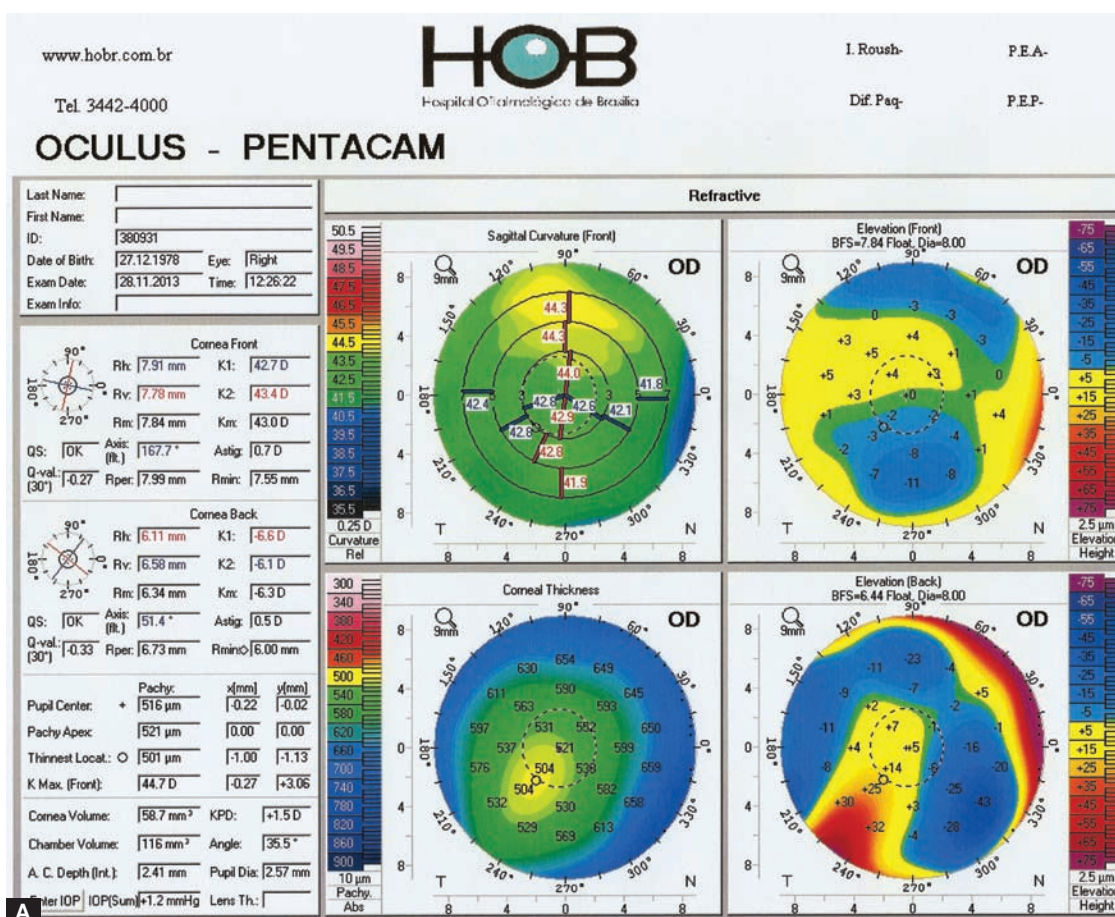
In the reported case, the patient had a previous acute conjunctivitis associated with frequent eye rubbing, leading to a temporary pseudokeratoconus with inferior steepening of the cornea at the topography and low visual acuity at the clinical examination. In 4 months, the steep keratometry reduced from 52.71D to 47.20D, the topographic astigmatism reduced from 7.13D to 1.50D and the apex curvature reduced from 57.71D to 44.10D, showing the significant change of this cornea. Like keratometry, pachymetry measurement





Figs 2A and B: (A) OD pentacam 09/26/13 and (B) OS pentacam 09/26/13





Figs 3A and B: (A) OD pentacam 11/28/13 and (B) OS pentacam 11/28/13

presented variations, with lower values at the presentation, probably because of reported changes in structure of the cornea when subjected to eye rubbing, such as slippage between the collagen fibers. McMonnies<sup>8</sup> showed that eye rubbing produces several changes in cornea's structure, which can contribute for the triggering and progression of keratoconus.

She has some related risk factors for had developed keratoconus in the past (family history, eye rubbing habit), but had not. The introduction of inflammatory mediators, because of the conjunctivitis, seems to have influenced the temporary distortion of the cornea. Probably because of her age and reduction of inflammatory molecules, the alteration remained only for this small period.

The diagnosis of pseudokeratoconus should always be suspected in cases of acute corneal deformity following any anterior ocular surface disease, as an acute conjunctivitis. Care should be taken to avoid intemperate measures, as an indication of any procedure, like

crosslinking or intrastromal corneal ring segments in these cases, as the condition is self-limited.

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