

# Form fruste pachydermoperiostosis associated with ptosis and floppy eyelid syndrome

Avi Rubinov, MD<sup>1</sup>; Bevin Bart, MD<sup>2</sup>; Allan Oryschak, MD<sup>3</sup>; Ezekial Weis, MD<sup>1</sup>; Andrew Ting, MD<sup>4</sup>

<sup>1</sup> Division of Ophthalmology, Department of Surgery, Faculty of Medicine, University of Calgary, Alberta, Canada.

<sup>2</sup> Department of Anesthesia, Rocky View General Hospital, Calgary, Alberta, Canada.

<sup>3</sup> Department of Pathology, Rocky View General Hospital, Calgary, Alberta, Canada.

<sup>4</sup> Division of Ophthalmology, Rocky View general Hospital, Calgary, Alberta, Canada.

## Abstract

Pachydermoperiostosis (PDP), also known as idiopathic or primary hypertrophic osteoarthropathy or Touraine-Solente-Gole Syndrome, is a rare genetic disorder affecting skin and bone, consisting of pachydermia and periostosis. Pachydermia is a thickening and furrowing of the skin and face in a manner that resembles the skin of a pachyderm. Periostosis is periosteal new bone formation in the long bones. In this report, a 16-year-old boy presented with bilateral ptosis and floppy eyelids. He was successfully treated with bilateral upper eyelid pentagonal wedge resections. Histopathology of the excised tissue demonstrated mild epidermal acanthosis and marked increased dermal collagen with thickening of individual fibers, consistent with pachydermia, as well as papillary conjunctival inflammation and Meibomian glands hyperplasia with ductal dilatation, consistent with floppy eyelid syndrome. Radiographic imaging did not demonstrate any signs of periostosis, confirming the diagnosis of form fruste PDP. In a diligent search of the peer-reviewed medical literature (using PubMed

and cross-referenced literature), this case may be the first report of floppy eyelid syndrome and ptosis associated with form fruste PDP.

## Introduction

Pachydermoperiostosis (PDP), also known as idiopathic or primary hypertrophic osteoarthropathy or Touraine-Solente-Gole Syndrome, is a rare genetic disorder affecting skin and bone, consisting of pachydermia and periostosis. Pachydermia is a thickening and furrowing of the skin and face in a manner that resembles the skin of a pachyderm (elephant, rhinoceros, hippopotamus). Periostosis is periosteal new bone formation in the long bones. PDP appears in 3 forms: complete, incomplete, and form fruste. In its complete form, PDP consists of thickening of scalp (cutis verticis gyrata) and face (pachydermia), swelling of periarticular tissue, clubbing of the digits, and periosteal new bone formation (periostosis). The incomplete form displays bony involvement with lack of pachydermia. The form fruste consists of minimal to absent periostotic changes.<sup>1</sup>

### Correspondence:

Avi Rubinov, MD  
University of Calgary  
7007 14th Street SW  
Calgary, AB T2V1P9 Canada  
E-mail: avi@rubinovl.com  
Phone: (587) 435-6430

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## Case Report

A 16-year-old boy of Mediterranean descent was referred for consultation due to irritation and discharge from both eyes for several months. Conservative treatment with tear substituents and warm eyelid compresses was partially effective. His past medical history was significant for microcytic anemia for which he was being treated with iron supplements. His ocular history was unremarkable. His mother states that his other siblings do not show similar signs of coarse facial features, but on his father's side there are family members with a similar phenotype.

On examination, his uncorrected visual acuity was 20/25 in the right eye and 20/32 in the left. Both eyelids were ptotic with a pronounced lateral droop component and a marginal reflex distance of 2 mm bilaterally (Figure 1). Levator function was normal in both eyelids. Long eyelashes, thickened eyelid skin, and horizontal laxity were present bilaterally. The upper eyelids of both eyes were easily everted displaying a papillary reaction bilaterally coinciding with floppy eyelid syndrome. On slit-lamp

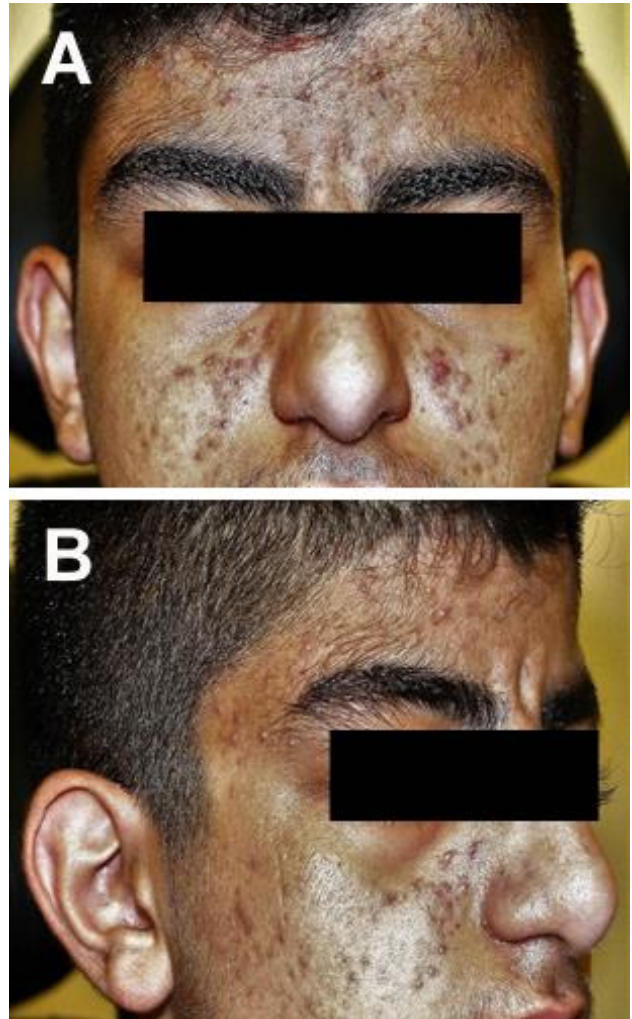


**Figure 1**

*External examination demonstrated bilateral ptosis with pronounced lateral droop.*

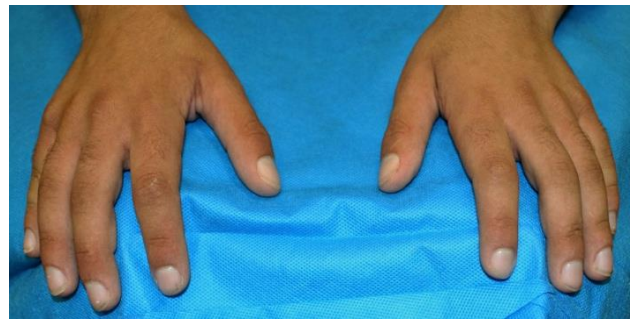
biomicroscopy and dilated funduscopy, the ocular globe demonstrated a normal ocular globe bilaterally. Coarse and thickened facial skin was present, associated with folliculitis and deep furrows on the forehead (Figure 2), as well as fingernail clubbing of both hands and feet (Figure 3). Radiographic imaging did not demonstrate any signs of periostosis.

Laboratory evaluation revealed a normal complete blood count as well as normal liver and kidney function tests. Surgery was performed and a full



**Figure 2**

*Facial examination disclosed deep furrowing of the forehead (A) prominently visible on ¾ profile of the face (B) as well as oily skin with folliculitis particularly on the forehead and cheeks.*

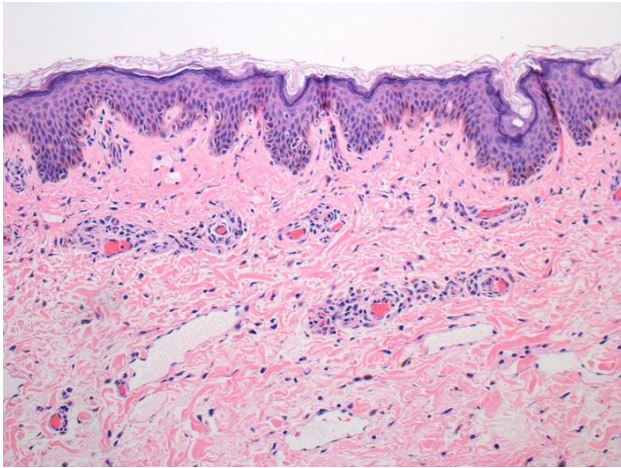


**Figure 3**

*Prominent clubbing of fingernails is present.*

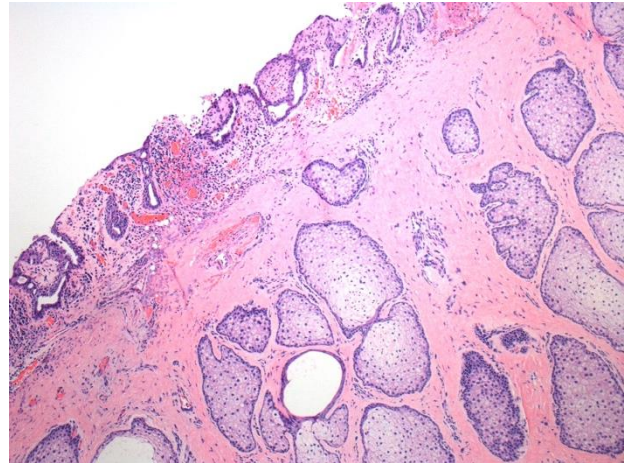


thickness pentagonal wedge of bilateral upper eyelids was removed. The histopathology of the eyelid specimen revealed a mild acanthosis of the epidermis. The dermis showed a marked increase in collagen with the thickening of individual fibers (Figure 4).



**Figure 4**  
Hematoxylin and eosin staining of the excised eyelid tissue demonstrated mild acanthosis of the epidermis and a marked increase in collagen density with increased fiber thickness of the dermal stromal collagen.

an inheritance pattern, both autosomal recessive and x-linked inheritance have been suggested to also be inheritance patterns.<sup>3</sup> Symptoms usually occur around puberty and males are affected 7 times more than females.<sup>4</sup> The underlying pathophysiology of



**Figure 5**  
Hematoxylin and eosin staining of the palpebral conjunctiva demonstrated chronic inflammation in a papillary configuration, as well as hyperplastic Meibomian glands in the underlying tarsus.

Mucin deposits were not demonstrated in the dermis. There was hyperplasia of the sweat glands and ducts as well as prominent hyperplasia of the Meibomian glands with dilatation of the ducts. The conjunctiva showed signs of chronic inflammation with a papillary configuration (Figure 5).

Following surgery, the symptoms of ocular irritation showed marked improvement. Marginal reflex distance was 2.5 mm in each eye with improved lateral droop.

## Discussion

Pachydermoperiostosis (PDP) is a rare genetic disease that accounts for 3-5% of all hypertrophic osteoarthropathy cases (i.e., the idiopathic or primary hypertrophic osteoarthropathy cases).<sup>2</sup> The inheritance pattern of PDP is unclear. Though an autosomal dominant mode with incomplete penetrance and variable expression has been shown as

PDP is unclear but altered peripheral blood flow and capillary stasis have been proposed.<sup>5</sup>

In order to diagnose a patient with PDP, two out of four Borochowitz criteria should be fulfilled: 1) a history of familial transmission, 2) pachydermia, 3) digital clubbing, and 3) skeletal manifestation such as joint pain or radiographic signs of periostosis.<sup>6</sup> Our patient showed evidence of pachydermia and clubbing, but did not show any signs of periostosis, joint swelling or pain, consistent with the form fruste PDP, which is characterized by paucity or absence of periostosis.<sup>1</sup>

The presence of floppy eyelid syndrome was confirmed histopathologically with the presence of hyperplasia of the sweat glands and ducts as well as prominent hyperplasia of the Meibomian glands with dilatation of the ducts, along with chronic papillary conjunctival inflammation. These features were similar to those described in PDP with floppy eyelids.<sup>5,7</sup> Floppy eyelid syndrome first described in

1981,<sup>8</sup> and the association of complete PDP with floppy eyelid syndrome as well as ptosis with thickened eyelids has been reported by several authors in the past.<sup>7-12</sup> In a diligent search of the peer-reviewed medical literature (using PubMed and cross-referenced literature), this case may be the first report of floppy eyelid syndrome and ptosis associated with form fruste PDP.

The etiology of ptosis in PDP cases is unclear, but excess heaviness of the eyelid due to increased bulk of soft tissue has been proposed.<sup>2</sup> Meibomian gland enlargement and hypertrophy along with a thickened tarsal plate lead to clinical and histologic features indistinguishable from primary floppy eyelid syndrome.<sup>7</sup>

Floppy eyelid syndrome is strongly associated with obstructive sleep apnea and keratoconus.<sup>13</sup> It has also been shown to coincide with Down syndrome.<sup>14</sup> The occurrence of floppy eyelids in a young healthy patient should alert the ophthalmologist to search for phenotypical features that might be present and reveal a systemic condition, such as ptosis presented in this case.

## References

- Girisha KM, Mandal K, Phadke SR. Milder form of pachydermoperiostosis: a report of four cases. *Clin Dysmorphol* 2009; 18(2): 85–9.
- Khanna V, Vaishya R. Pachydermoperiostitis: a case report. *Apollo Med* 2016; 13(1): 67–8.
- Supradeeptha C, Shandilya SM, Vikram Reddy K, Satyaprasad J. Pachydermoperiostosis: a case report of complete form an literature review. *J Clin Orthop Trauma* 2014; 5(1): 27–32.
- Reginato AJ, Schiapachasse V, Guerrero R. Familial idiopathic hypertrophic osteoarthropathy and cranial suture defects in children. *Skeletal Radiol* 1982; 8(2): 105–9.
- Vogl A, Goldfischer S. Pachydermoperiostosis: primary or idiopathic hypertrophic osteoarthropathy. *Am J Med Elsevier* 1962; 33(2): 166–87.
- Borochowitz Z, Rimoin DL. Pachydermoperiostosis. *Birth Defects Encyclopaedia* 1990; 1349–1350.
- Downes RN, Mininni F, Collin JRO, et al. Floppy eyelid syndrome in pachydermoperiostosis. *Orbit* 1989; 8(2): 93–9.
- Culbertson WW, Ostler HB. The floppy eyelid syndrome. *Am J Ophthalmol* 1981; 92(4): 568–75.
- Friedhofer H, Salles AG, Gemperli R, Ferreira MC. Correction of eyelid anomalies in pachydermoperiostosis. *Ophthal Plast Reconstr Surg* 1999; 15(2): 137–8.
- Kirkpatrick JN, McKee PH, Spalton DJ. Ptosis caused by pachydermoperiostosis. *Br J Ophthalmol* 1991; 75(7): 442–6.
- Berdia J, Tsai FF, Liang J, Shinder R. Pachydermoperiostosis: a rare cause of marked blepharoptosis and floppy eyelid syndrome. *Orbit* 2013; 32(4): 266–9.
- Bleyen I, White VA, Dolman PJ. Floppy eyelid syndrome and ptosis in a patient with pachydermoperiostosis. *Ophthalmic Plast Reconstr Surg* 2010; 26(4): 293–5.
- Ezra DG, Beaconsfield M, Sira M, et al. The associations of floppy eyelid syndrome: a case control study. *Ophthalmology* 2010; 117(4): 831–8.
- Boulton JE, Sullivan TJ. Floppy eyelid syndrome and mental retardation. *Ophthalmology* 2000; 107(11): 1989–91.