

ENIGMATIC MORPHO INSIGHT

Hyaline ring granuloma

Oral pulse granuloma (PG) is one of the terms used to describe oral inflammatory lesions characterized microscopically by the presence of giant cells and aggregates of thin, variably sized hyaline rings. It is rarely diagnosed clinically and remains largely a microscopic diagnosis.

PG is a controversial lesion with regard to its etiopathogenesis and nomenclature. It has been described in the literature under a variety of names, since its inception by Lewars as “chronic periostitis” in 1971.^[1]

Vegetable granuloma (VG) or PG is so called as it is caused due to entrapment of vegetable or plant material. “Pulse,” (Old French, pouls = porridge) refers to the seeds of a leguminous pod such as peas and beans. Various terminologies designate this lesion namely chronic periostitis with hyaline rings, giant cell hyaline angiopathy, PG, oral VG, legume associated lesion, starch cell granuloma, periostitis and osteitis with hyaline bodies, granuloma in edentulous jaws, food-induced granuloma and granulation tissue with giant cells and hyaline change. The recent descriptive term introduced is hyaline ring granuloma that is reported to occur in inflammatory and developmental odontogenic cysts.^[2]

The hematoxylin and eosin stained section shows thin, glassy pink aggregates of hyaline rings [Figure 1]. The hyaline rings are noted as double layered refractile membranes appearing as polygonal or hexagonal structures enclosing amorphous material consistent with degenerated starch cells [Figure 2]. They are associated with dense chronic inflammatory infiltrate surrounding the hyaline rings. Under polarized microscopy, the vegetable matter appears

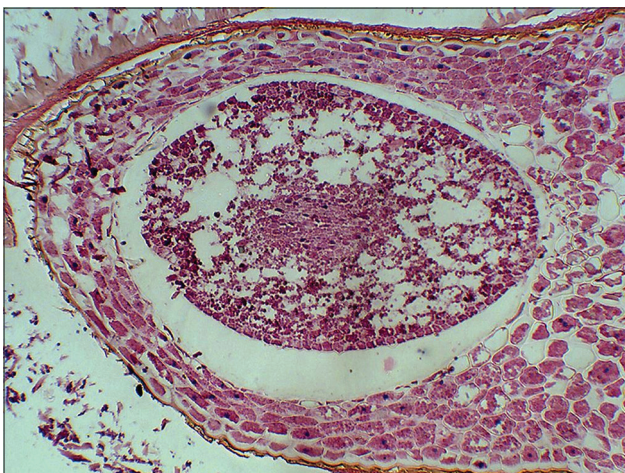


Figure 1: Thin, glassy pink aggregates of hyaline rings (H&E stain, ×100)

as birefringent particles with the outer cellulose membrane showing light birefringence and the starch within appearing dark. The hyaline rings stain positive for periodic acid-Schiff (PAS), thus confirming the cellulose content of the vegetable matter [Figure 3] and negative for Van Gieson stain.

These commonly occur in inflammatory and developmental odontogenic cysts. Oral PG occurs in the posterior region of an edentulous mandible, in periapical areas of grossly decayed teeth or retained roots and teeth with a history of endodontic therapy, where the root canal has been left open. It can also be associated with a history of pericoronitis, in postextraction tissue reactions or as part of a cyst wall where there has been a communication with the oral cavity.^[3]

The etiopathogenesis for VG has been explained based on two concepts, that is, exogenous and endogenous concepts:

- Exogenous theory – The origin of the hyaline rings is due to foreign material (pulse and legumes) that penetrate the oral mucosa or gastrointestinal tract or lungs
- Endogenous theory – The rings are due to hyaline degenerative changes in walls of blood vessels, degraded collagen, or fibrosed extravasated serum proteins of these lesions.^[4]

Talacko and Radden have suggested that implanted food particles in VG or PG get rapidly digested and also get altered by host responses. The cellulose part of plant foods being indigestible persists in the form of hyaline material, whereas, the starch matter gets digested. This cellulose moiety invokes a chronic granulomatous response.^[5]

The lentil is a member of the legume family; legumes are also referred to as pulses. The characteristic structure of a leguminous seed is that of a shell surrounding the cotyledon,

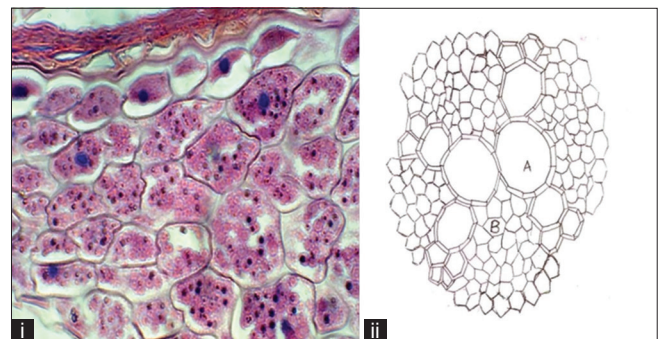


Figure 2: (i) Polygonal or hexagonal structures enclosing amorphous material consistent with degenerated starch cells (H&E stain, ×400). (ii) Hand drawn illustration of xylem (A) and phloem (B) resembling hyaline granuloma



Figure 3: The hyaline rings stained positive for Periodic Acid-Schiff, thus confirming the cellulose content of the vegetable matter (PAS stain, $\times 40$)

which is a honeycombed structure containing stored food, chiefly starch grains. The starch grains are slightly ellipsoid in shape and up to 60 μm in diameter. Both the outer shell and cotyledon are composed primarily of cellulose. The cellulose and other mucosubstances in the cell walls are stained with PAS reagent on account of the presence of vic-glycols; these reactions are unaffected by prior diastase digestion. Vegetable cell walls also contain acidic groups, such as carboxyls, which are stained by Alcian blue at pH 2.5.^[6]

Contamination and subsequent retention of foreign bodies within wound surfaces may negatively influence healing following maxillofacial injuries. Hyaline ring granulomas should, therefore, be considered in the differential diagnosis of growths originating from the region around soft tissue wound surfaces.

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Conflicts of interest

There are no conflicts of interest.

Rajiv S Desai

Department of Oral Pathology, 5th Floor,
Nair Hospital Dental College, Dr. A L Nair Road,
Mumbai Central, Mumbai - 400 008, Maharashtra, India.
E-mail: nansrd@hotmail.com

REFERENCES

1. Manjunatha BS, Kumar GS, Raghunath V. Histochemical and polarization microscopic study of two cases of vegetable/pulse granuloma. *Indian J Dent Res* 2008;19:74-7.
2. Sowmya SV, Patil S, Rao RS. Vegetable granuloma in Pindborg's tumor: A rare encounter. *J Int Oral Health* 2014;6:108-10.
3. Padmanabhan MY, Aparna R, Karthikeyani S, Dinakar J, Manickaraj M. Pulse granuloma as a complication following dental trauma in children. *J Dent Child (Chic)* 2013;80:121-5.
4. Philipson HP, Reichart PA. Pulse or hyaline ring granuloma. Review of the literature on etiopathogenesis of oral and extraoral lesions. *Clin Oral Investig* 2010;14:121-8.
5. Talacko AA, Radden BG. Oral pulse granuloma: Clinical and histopathological features. A review of 62 cases. *Int J Oral Maxillofac Surg* 1988;17:343-6.
6. Talacko AA, Radden BG. The pathogenesis of oral pulse granuloma: An animal model. *J Oral Pathol* 1988;17:99-105.

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