

## Vegetable Granuloma in Pindborg's Tumor: A Rare Encounter

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### Abstract:

Vegetable granuloma (VG) or pulse granuloma is an enigmatic lesion in terms of its designated nomenclature and etiopathogenesis. It is less often reported in the walls of inflammatory and developmental odontogenic cysts. It can present different histological characteristics, possibly related to the length of time in the tissue and its location. Due to its deceptive appearance, it can often mislead the pathologists. Here, we report an unusual encounter of VG in a Pindborg's tumor, which is the first of its kind in the literature.

**Key Words:** Hyaline ring, Pindborg's tumor, pulse granuloma, vegetable granuloma

### Introduction

Vegetable granuloma (VG) or pulse granuloma (PG) is so called as it is caused due to entrapment of vegetable or plant material.<sup>1</sup> "Pulse," (Old French, pouls = porridge) refers to the seeds of a leguminous pod such as peas and beans.<sup>2</sup> Various terminologies designate this lesion since its inception in 1971 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.<sup>3</sup>

These granulomas are observed in the oral cavity, lung, intestine, skin, gallbladder and uterine tubes.<sup>4</sup> In the oral cavity, its preferred location is in the extracted sockets. It is less frequently associated with periapical lesions of post-

endodontically treated teeth, in the connective tissue capsule of odontogenic cysts and tumors e.g., residual, dentigerous, keratocystic odontogenic tumor, unicystic ameloblastoma; and non-odontogenic cysts like nasopalatine cyst.<sup>1,5-7</sup>

We encountered PG in an inflamed case of calcifying epithelial odontogenic tumor (CEOT) or Pindborg's tumor as an incidental finding.

### Unearthing: A Rare Entity

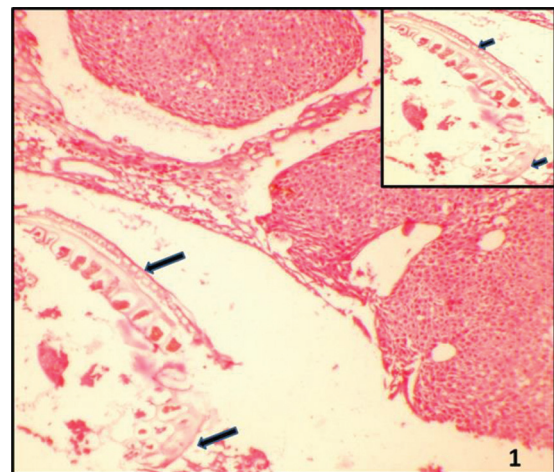
#### Histopathology

The present case showed hyaline areas in the stroma of CEOT (Figure 1). The hyaline rings were noted as double layered refractile membranes appearing as round or irregular structures enclosing amorphous material consistent with degenerated starch cells (Inset of Figure 1). They were associated with dense chronic inflammatory infiltrate and few foreign body type giant cells in a fibrous stroma.

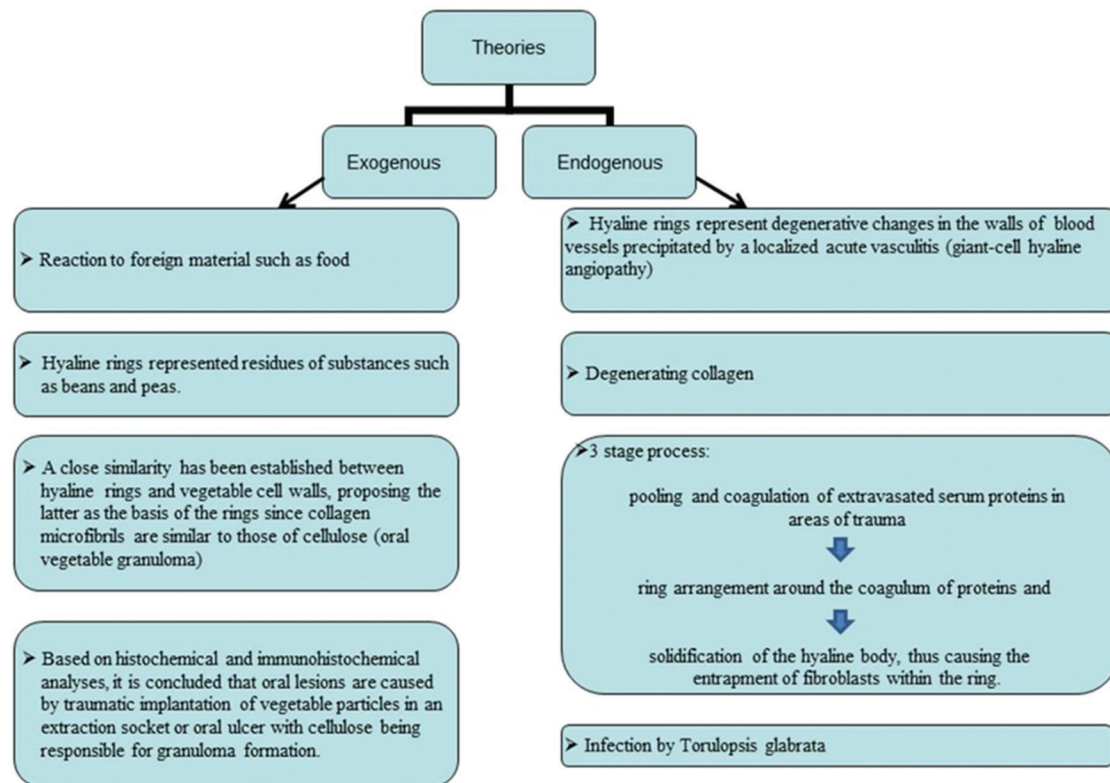
The hyalinized areas, appearing glassy pink in colour as noted in hematoxylin and eosin, stained positive for periodic acid-Schiff (PAS), thus confirming the cellulose content of the vegetable matter, while polarized light microscopy showed birefringent refractile particles (Figure 2a and b).

### Discussion

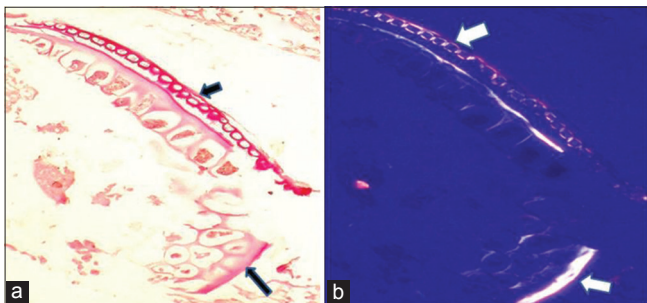
The appearance of PG varies based on the time of evolution and location of the lesion. It shows hyaline rings which represent the



**Figure 1:** Photomicrograph of Pindborg's tumor showing sheets of epithelial cells associated with vegetable granuloma (Arrows) (H and E, ×10). Inset highlights the vegetable matter with few giant cells.



**Flow chart 1:** Etiopathogenesis of hyaline ring granuloma.



**Figure 2:** (a) Photomicrograph of the vegetable matter showing periodic acid-Schiff (PAS) stain positivity (PAS, ×40). (b) Photomicrograph of the vegetable matter appearing as birefringent refractile material under polarized microscope (×40).

cellulose envelopes surrounding the starch granules inducing a foreign body reaction with giant cells when viewed microscopically. Foci of calcification may be found in the centre of the hyaline rings with collagen condensation at the lesional periphery.<sup>6</sup> The present case appeared similar with presence of hyaline rings in the stroma of Pindborg's tumor invoking a granuloma formation accompanied by few giant cells. Studies have found increased number of giant cells in primitive compared to aged lesions, which represented as calcifications within eosinophilic areas.<sup>4</sup> Oral lesions differ from lesions of the lungs and gut by the absence of starch cells and presence of few giant cells.<sup>6</sup>

Special stains like PAS, Alcian blue and Van Gieson can be demonstrated to confirm the vegetable matter. The cellulose

part of the vegetable matter shows positive in PAS and Alcian blue, whereas the condensed peripheral collagen shows positivity for Van Gieson.<sup>1</sup> Our case showed similar results for PAS.

In polarized microscopy of the present case, the vegetable matter appeared as birefringent particles with the outer cellulose membrane showing light birefringence and the starch within appearing dark which are in concordance with the observations of other studies in the literature.<sup>1,6</sup>

#### Etiopathogenesis

Two opposing etiologic theories have been proposed for the origin of hyaline rings & thus the pathogenesis of this granulomatous lesion (Flow Chart 1).<sup>1,4,6</sup>

It has been suggested by few authors that implanted food particles in VG get rapidly digested and altered by host response. The indigestible cellulose part of plant foods appears hyaline and initiates a granulomatous reaction.<sup>1,4,6</sup>

#### Conclusion

The recognition of VG is important to rule out other serious pathological lesions or malignancies, which they simulate clinically. Thus, the diagnosis is mainly established by microscopic features and rarely based on clinical examination.

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