

Rectal Pulse Granuloma

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● **Pulse granuloma is a rare benign entity, most likely representing a foreign body reaction to vegetable particles. We report a case of a pulse granuloma involving the rectum. The patient presented with a submucosal and intramuscular mass lesion found at routine rectal examination and subsequent colonoscopy. The mass was excised and the microscopic examination revealed acute and chronic inflammatory cells, foreign-body giant cells, vegetable matter, and convoluted hyaline rings and scattered circular structures containing basophilic granules, consistent with pulse granuloma. There are a few reports in the literature of pulse granulomas, with most occurring in the oral cavity or lungs. To the best of our knowledge, this is the first reported example of pulse granuloma in the rectum. Although rare, familiarity with this entity's distinctive histopathologic features may avoid a delay in diagnosis and prevent the expense of distinguishing it from its histologic lookalikes.**

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Pulse granuloma is a rare benign entity that has also been called oral vegetable granuloma¹ and giant cell hyaline angiopathy.² Most of the literature suggests that the pathogenesis is a foreign body reaction to ingested legume parenchymatous cells at various stages of digestion.^{1,3–7} Vegetable particles have been demonstrated associated with granulomas and hyaline rings in most of the reported cases in the literature^{4,5,8–10} and in 2 reviews of a larger number of cases.^{3,6} The histologic and ultrastructural findings of a series of cases of pulse granulomas have also been reported.¹ Animal experiments with injection of vegetable matter in lungs and oral cavity have demonstrated reactions similar to lentil granulomas observed in humans.^{3,7}

Pulse granulomas occur most frequently in the oral cavity of edentulous patients or in patients with a history of dental procedures.^{1,2,5,6} Patients usually present with recurrent swelling in posterior portions of edentulous mandibles associated with a complete lower denture.⁶ Patients may present with lesions in the wall of periapical cysts with prolonged therapeutic opened drainage or dentigerous cysts.⁶ The lesions can be fluctuant or firm and are

generally tender to palpation.⁶ However, they also can be completely asymptomatic and present as an incidental clinical or radiological finding.⁶ Occasional discharge from the affected region has been reported in some cases.⁶ Treatment involves excision or curettage.⁶

The literature also contains reports of pulse granulomas occurring in the lungs of patients prone to aspiration, causing lentil aspiration pneumonia.^{3,4} To the best of our knowledge, we report the first example of pulse granuloma involving the rectum.

REPORT OF A CASE

A 78-year-old African-American woman was found at routine digital rectal examination to have a firm rubbery mass in the right anterior lateral aspect of the distal rectum. A colonoscopy was performed and a 1- to 2-cm submucosal rectal lesion was found extrinsic to the mucosa. The patient had no symptoms, previous surgeries, and/or history of a diet rich in lentils. The clinical impressions were carcinoid tumor or lymphoid hyperplasia, and a transanal excision of this rectal mass was performed.

Grossly, the resected specimen consisted of a portion of rectal mucosa and submucosal tissue measuring 2 × 2 × 1.5 cm. The sectioned surface revealed a submucosal, slightly firm, gray-white lesion, measuring 1.2 cm in maximum diameter and grossly resembling a diverticular abscess. Microscopic examination of the lesion with hematoxylin-eosin demonstrated a nodular lesion in the submucosa and muscularis propria. The central portion of the lesion consisted mainly of acutely and chronically inflamed granulation tissue. The periphery of the lesion was composed of variably sized (200 to >500 μm in diameter), convoluted hyalinized rings and scattered circular structures containing calcified basophilic granules (2–40 μm in diameter) (Figures 1 and 2). Foreign body-type giant cells were interspersed throughout the lesion, and a clearly identifiable particle of vegetable matter was present (Figure 3). The hyalinized ringlike structures stained negatively for Congo red, Thioflavin T, CD34 (Ventana, Tucson, Ariz), CD31 (Ventana), and factor VIII (Dako Corporation, Carpinteria, Calif). Variably positive staining for periodic acid-Schiff, with and without pretreatment with diastase, and pale blue staining with trichrome stain were demonstrated. Grocott methenamine silver stain was negative for fungus, and Ziehl-Neelsen stain was negative for acid-fast bacilli. Von Kossa stain demonstrated calcified fragments within the circular structures. Based on these findings, the diagnosis of pulse granuloma was made. The patient had an uneventful course following surgery.

COMMENT

The majority of pulse granulomas occur in the oral cavity.^{1,2,5,6} However, granulomatous reactions to vegetable matter have also been described in lungs,^{3,4} knee,⁸ fallopian tube and ovary,⁹ and intrahepatic portal vein.¹⁰ Surprisingly, pulse granuloma has not been reported in the gastrointestinal tract.

The clinical differential diagnoses of our case were car-

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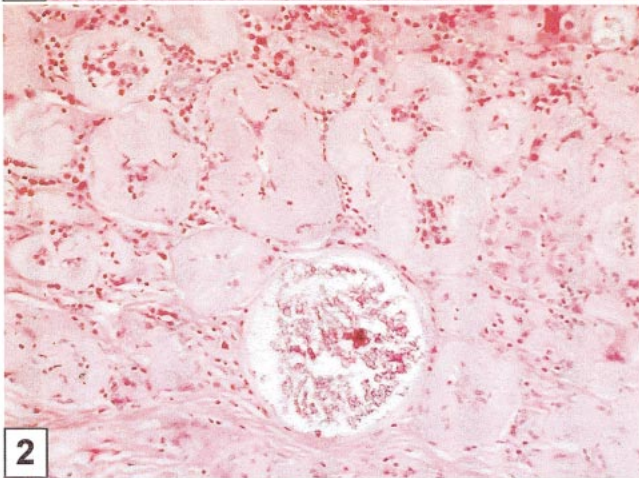
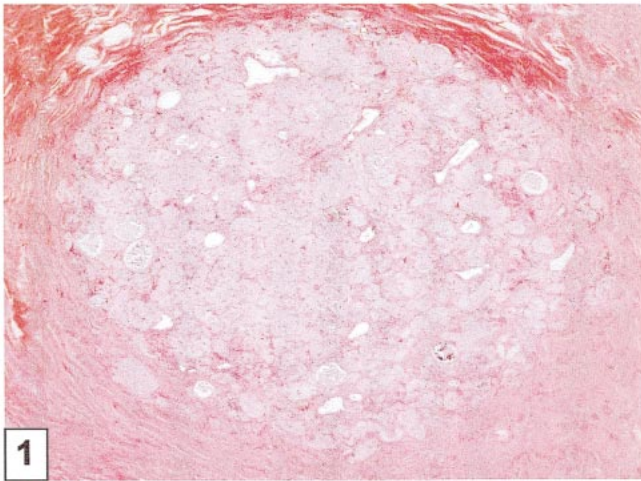


Figure 1. Low magnification of the periphery of the lesion shows a nodule consisting of hyalinized rings with interspersed circular structures containing calcified basophilic granules (hematoxylin-eosin, original magnification $\times 50$).

Figure 2. High-power view showing convoluted hyalinized rings. A circular structure containing calcified basophilic granules is seen on the inferior part of the field (hematoxylin-eosin, original magnification $\times 200$).

Figure 3. High-power view demonstrating a clearly identifiable particle of vegetable matter surrounded by foreign-body giant cells and acute and chronic inflammatory cells (hematoxylin-eosin, original magnification $\times 630$).

cinoid tumor and lymphoid hyperplasia, which were readily excluded by microscopic examination. The microscopic features of pulse granuloma evoke a differential diagnosis that includes infectious agents as well as inflammatory and vascular diseases. The collections of ring structures prompt consideration of a vascular malformation, but the elastic and muscular structures of vessels were not present. The thickened hyalinized walls of the ring structures also superficially resembled the vascular changes created by the amorphous protein deposits of amyloidosis. However, histochemical examination of the ring structures revealed no evidence of amyloid deposition.

The inflammatory infiltrate raised the possibility of an infectious granulomatous disease or a conventional diverticular abscess. The inflammatory component was composed of both mononuclear and polymorphonuclear cells, and foreign body-type giant cells. However, Gram, Grocott methenamine silver, and Ziehl-Neelsen stains revealed no bacterial, fungal, or mycobacterial microorganisms. The spherical structures containing calcified basophilic granules could potentially be mistaken for fungal forms, such as *Coccidioides*, but the endospores of *Coccidioides* are consistently 2 to 4 μm in diameter, whereas the basophilic granules of pulse granuloma vary greatly in size (2–40 μm). Moreover, the calcific nature of the granules was confirmed by von Kossa stain. Awareness of the significance of the combination of the hematoxylin-eosin findings seen in pulse granuloma may obviate the need for special stains and avoid unnecessary delay and expense.

References

1. Harrison JD, Martin IC. Oral vegetable granuloma: ultrastructural and histological study. *J Oral Pathol.* 1986;15:322–326.
2. McMillan MD, Kardos TB, Edwards JL, Thorburn DN, Adams DB, Palmer DK. Giant cell hyaline angiopathy or pulse granuloma. *Oral Surg.* 1981;52:178–186.
3. Knoblich R. Pulmonary granulomatosis caused by vegetable particles. *Am Rev Respir Dis.* 1969;99:380–389.
4. Maron EM, McAdams HP, Sporn TA, Goodman PC. Lentil aspiration pneumonia: radiographic and CT findings. *J Comput Assist Tomogr.* 1998;22:598–600.
5. Mincer HH, McCoy JM, Turner JE. Pulse granuloma of the alveolar ridge. *Oral Surg.* 1979;48:126–130.
6. Talacko AA, Radden BG. Oral pulse granuloma: clinical and histopathological features. *Int J Oral Maxillofac Surg.* 1988;17:343–346.
7. Talacko AA, Radden BG. The pathogenesis of oral pulse granuloma: an animal model. *J Oral Pathol.* 1988;17:99–105.
8. Carandell M, Roig D, Benasco C. Plant thorn synovitis. *J Rheumatol.* 1980;7:567–569.
9. Mesia AF, Lam H, Wallach RC. Xanthogranulomatous tubo-ovarian abscess resulting from chronic diverticulitis. *Gynecol Obstet Invest.* 2000;49:70–72.
10. Soares MA, Wanless IR, Ambus U, Cameron R. Fistula between duodenum and portal vein caused by peptic ulcer disease and complicated by hemorrhage and portal vein thrombosis. *Am J Gastroenterol.* 1996;91:1462–1463.