



Case Series

Rare pathological lesions of appendix – A case series

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ABSTRACT

Acute appendicitis is the most common disease of appendix. Here we are introducing 6 rare lesions of appendix from a tertiary care centre North Kerala. These incidental findings reveals the importance of extensive sampling of appendicectomy specimens.

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1. Introduction

Appendix is a vestigial organ in which the commonly encountered disease is acute appendicitis. Still, the pathologist has to search for various rare lesions. Increased use of CT scan has led to increased detection of appendicular neoplasms and other rare lesions pre operatively. This is a series of 6 rare lesions of appendix from a tertiary care centre in district of North Kerala, India. These include one case of goblet cell adenocarcinoma appendix, two cases of low grade appendiceal mucinous neoplasm, one case of serrated lesion with low grade dysplasia one appendiceal diverticulosis and one case of angiodysplasia of appendix. All were incidental findings in appendectomies done for acute appendicitis.

2. Case History

2.1. Case 1

41 year old Female complains of pain in the left iliac fossa and fever, associated with vomiting and nausea. On examination tenderness in the right iliac fossa noted USG suggestive of acute appendicitis.

Grossly we received appendicectomy specimen as fragments, aggregate measuring 2.5x2x1 cm. Microscopy showed ulcerative mucosa having a neoplasm composed of cells arranged as clusters and as single cells in lamina propria, submucosa and muscularis propria. Cells show signet ring morphology (Figure 1).

Special stain showed Alcian blue positivity. Immunohistochemistry showed positivity of CK7, CK20, Synaptophysin and Chromogranin (Figure 2).

Final diagnosis: Goblet cell adenocarcinoma.

2.2. Case 2

70year old female patient presented with complains of abdominal pain, vomiting for 2 months. On examination,

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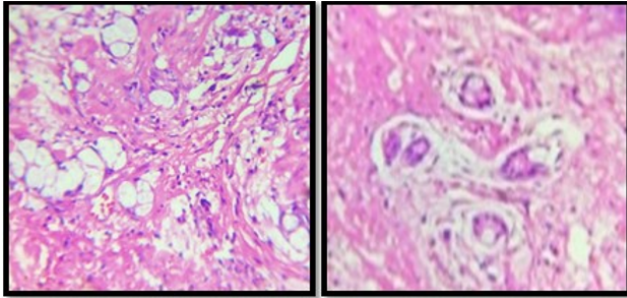


Figure 1: Cells with signet ring cell morphology invading muscularis propria

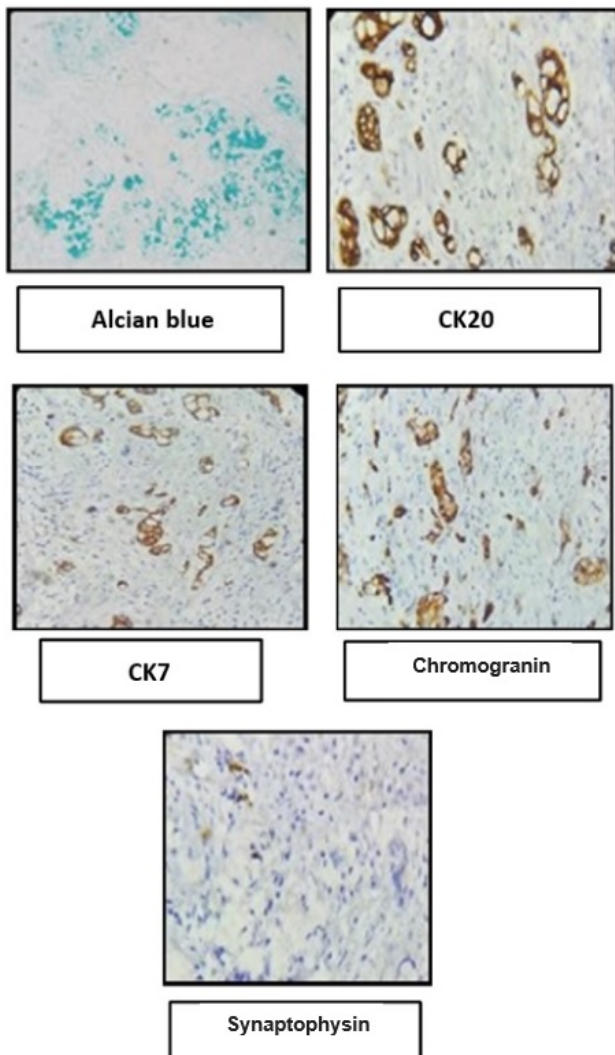


Figure 2: Showing special stain (Alcian blue) and immunohistochemistry positivity (CK7, CK20, Synaptophysin and chromogranin)

Tenderness over both iliac fossa and hypogastrum noted. CECT showed well circumscribed tubular mass in ileocaecal region and USG showed cystic lesion in right side of pelvis suggestive of mucocele. Gross finding showed cystically enlarged appendix which drained gelatinous material (Figure 3) and microscopy showed appendix lined by undulating pseudostratified epithelium with apical mucin.

Diagnosis: Low grade appendiceal mucinous neoplasm, limited to mucosa, base of appendix is free of tumour.



Figure 3: Gross appendix with cystically enlarged appendix with inner surface showing mucin

2.3. Case 3

70 year old female known case of systemic hypertension and bronchial asthma presented with swelling in the umbilical region. CECT Abdomen showed complex right adnexal cyst, measuring 6.2x5 cm, extending into the right iliac fossa likely ovarian cyst. Foci of calcification seen Microscopy showed appendix showing scalloping of epithelium with nuclear pseudo stratification. Extravasated mucin seen. (Figure 4)

Diagnosis: Low grade appendiceal mucinous neoplasm, Grade 1.

2.4. Case 4

53 years old female, complains of abdominal pain for 1 day. On examination rebound tenderness present. Total count-16000/cu mm². USG showed increased vascularity of appendix. Grossly Appendectomy specimen measuring 6.2x1.3 cm, Outer surface is pale brown and shows congested blood vessels, cut section shows mucoïd material in the lumen. On microscopy shows Appendix lined by hyperplastic epithelium with abnormal crypt proliferation and elongated, serrated crypts. (Figure 5)

Diagnosis: Serrated lesion with low grade dysplasia with features of acute appendicitis.

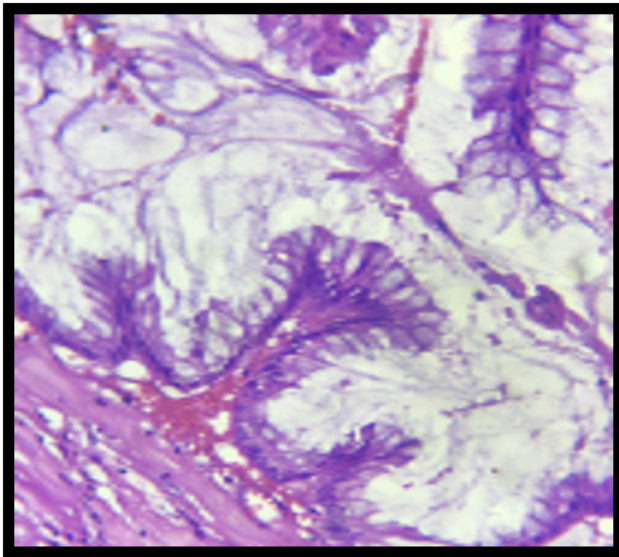


Figure 4: Microscopy with scalloping of epithelium with pseudo stratification

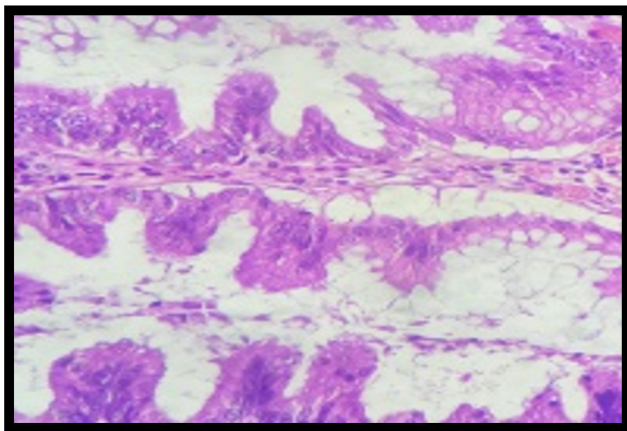


Figure 5:

2.5. Case 5

Years old male, complains of abdominal pain for 3 weeks, rebound tenderness present USG showed Acute appendicitis with loculated collection at tip. Gross shows Appendix with mucinous material. Microscopy shows diverticula with epithelium showing filiform arrangement and mild atypia of lining (Figure 6).

Diagnosis: Appendiceal diverticulosis of tip of appendix with mild atypia of epithelium, evidence of perforation and extravasation of mucin.

2.6. Case 6

41years old male, complains of bleeding per rectum for 3 days with clots. No history of maleana. Spiral CT of Abdomen: Enhancing enlarged appendix with a prominent

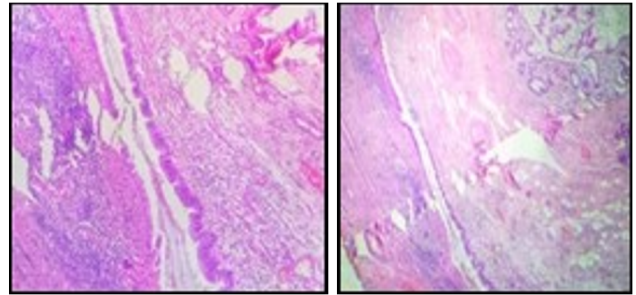


Figure 6: Microscopy shows diverticula with epithelium showing filiform arrangement and mild atypia of lining

and tortous appendicular artery, Angidysplasia of appendix. Microscopy thick and thin walled ectatic congested blood vessels in submucosa extending to muscularis propria (Figure 7).

Diagnosis: Angiodysplasia of appendix.

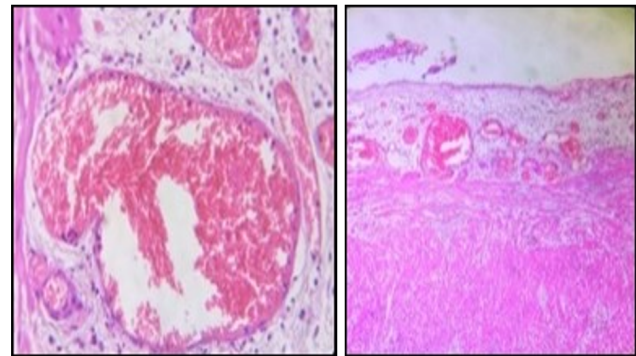


Figure 7: Microscopy thick and thin walled ectatic congested blood vessels in submucosa extending to muscularis propria

3. Discussion

Goblet cell adenocarcinoma accounts for less than 14% of appendiceal neoplasms. It is an amphicrine tumour composed of goblet like mucinous cells and endocrine cells. It is rare with incidence of only 0.05 cases per 1 lakh population. Despite previous goblet cell carcinoid terminology, goblet cell adenocarcinoma is considered a variant of adenocarcinoma and is distinct from neuroendocrine neoplasm.¹

Grossly normal to thickened appendiceal wall. Often overlooked due to absence of gross mass lesion. Microscopically Concentric / circumferential infiltration of the appendiceal wall by small tubules, nests, clusters or cords of tumor cells with goblet cell morphology (small, compressed nuclei with intracytoplasmic mucin).²

Mucicarmine, CK20, SATB2, Synaptophysin and chromogranin positive and ki67 variable.

Table 1: Low grade versus high grade histological features

Low grade carcinoma	High grade carcinoma
Goblet-like mucinous cells arranged in a tubular pattern with or without lumens	Complex anastomosing, cribriforming confluent solid sheets, single file growth pattern
Variable number of endocrine and paneth-like cells	Numerous poorly cohesive goblet-like or non mucinous cells, single goblet or signet-like cells or adenocarcinomatous glands floating in mucin pools
Low grade cytology	High grade cytology, Necrosis, desmoplastic stroma

Table 2: Youz 3 tier grading system based on low grade versus high grade patterns³

Grade	Low grade pattern (tubular or clustered growth)	Any combination of high grade features (loss of tubular or clustered growth)
1	>75%	<25%
2	50-75%	25-50%
3	<50%	>50%

Debate on performing appendectomy with clear margins versus right hemicolectomy as treatment. Prognosis depends upon stage.

LAMN (Low Grade Appendiceal Mucinous Neoplasm) is characterized by mucinous epithelial proliferation with extracellular mucin and pushing margins. Its incidence is 1% of gastrointestinal neoplasms and is found in less than 0.3% of appendectomy specimens.

Low grade appendiceal mucinous neoplasm (LAMN) is a low grade noninvasive epithelial proliferation that can cause pseudomyxoma peritonei if the appendix ruptures. Similar, rare lesions with high grade nuclear dysplasia are termed high grade appendiceal mucinous neoplasm (HAMN).

Typically occurs in patients during their sixth decade of life, although age range is broad; more common in women. Most patients with disease restricted to the appendix present with acute appendicitis-like symptoms, while those with disseminated disease may present with abdominal or ovarian masses or pseudomyxoma peritonei.⁴

Grossly Typically, appendix appears dilated with luminal mucin, although diameter may appear unremarkable. Serosa appears smooth when appendiceal wall is intact. Adhesions or extra-appendiceal mucin are concerning for underlying rupture. Microscopically Villous or occasionally flat proliferation of mucinous epithelial cells originating from appendiceal lumen. Lesional cells typically demonstrate abundant apical mucin with elongated nuclei and low grade nuclear atypia (LAMN). Positive IHCs are CK20, CDX2, SATB2.⁵ Molecular genetics involve KRAS mutations and loss of chromosome 5q has been reported to occur in 50%

of cases and also have TP53 or ATM mutations.⁶

Treatment includes Simple appendectomy for lesions limited to appendix. Disseminated peritoneal disease may be treated with hyperthermic intraperitoneal chemotherapy (HIPEC) following cytoreductive surgery. Prognosis is excellent.

Appendiceal serrated lesions are mucosal epithelial polyps characterised by saw tooth like architecture. It is common in 6th to 8th decade of life. It may cause obstruction and may rupture. Microscopically Localized serrated epithelial lesion within the luminal appendix, with retention of the muscularis mucosae, often circumferential. Typically minimal to no nuclear atypia, though visible cytologic dysplasia (low grade or high grade) may sometimes be present. Appendiceal serrated lesions are associated with KRAS and BRAF mutations.⁷

Diverticular disease of appendix arise in a weak area as a result of increased intraluminal pressure. It may perforate and mimic LAMN. Incidence is only 0.95%. Size usually less than 5 millimetre. Microscopically herniation of mucosa and muscularis mucosa through the wall of appendix.⁸

Angiodysplasia of the gastrointestinal tract is thought to be one of the most common causes of lower gastrointestinal bleeding in the elderly, and, in the majority of cases, lesions are located in the cecum or ascending colon. The authors report an extremely rare case of appendicular angiodysplasia.⁹

Angiodysplasia of appendix is common in older age group and may cause bleeding. Colonic angiodysplastic lesions are presumed to be degenerative in nature, secondary to obstruction or hypoxemia. Appendicular angiodysplasia is very rare. Grossly appendix is distended. On microscopic examination dilated submucosal blood vessels seen.

4. Conclusion

Acute appendicitis is the most common indication of appendectomy world wide. Rare pathological lesion are also encountered in some situations. Clinical features may also mimic acute appendicitis. CT scanning and other newer modalities help in diagnosis. Multiple and dense sampling of appendectomy specimens increases the likelihood of detecting unusual lesions of appendix.

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6. Conflict of Interest

None.

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