



Imperial College Healthcare
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Ganglioneuromatosis of the appendix

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Background

- Benign hamartomatous proliferation of ganglion cells, Schwann cells and nerve fibres
- Frequently associated with multiple endocrine neoplasia type IIb, neurofibromatosis type 1 or phosphatase and tensin homolog hamartoma (PTEN) syndrome
- Two subtypes: solitary or multiple/ disseminated (ganglioneuromatous polyposis)
- Most frequently involved GIT sites: ileum, colon, appendix
- Other locations: retroperitoneum, mesentery, mediastinum

Case presentation

- 30 old year female, presented with recurrent abdominal pain and microscopic haematuria.
- She had a history of NF1 (multiple cafe au lait spots, axillary freckling, scoliosis and short stature, also pulmonary stenosis in keeping with Watson syndrome).
- Patient had previously MRI brain and US breast (Figure 1 and 2) showing neurofibromas.

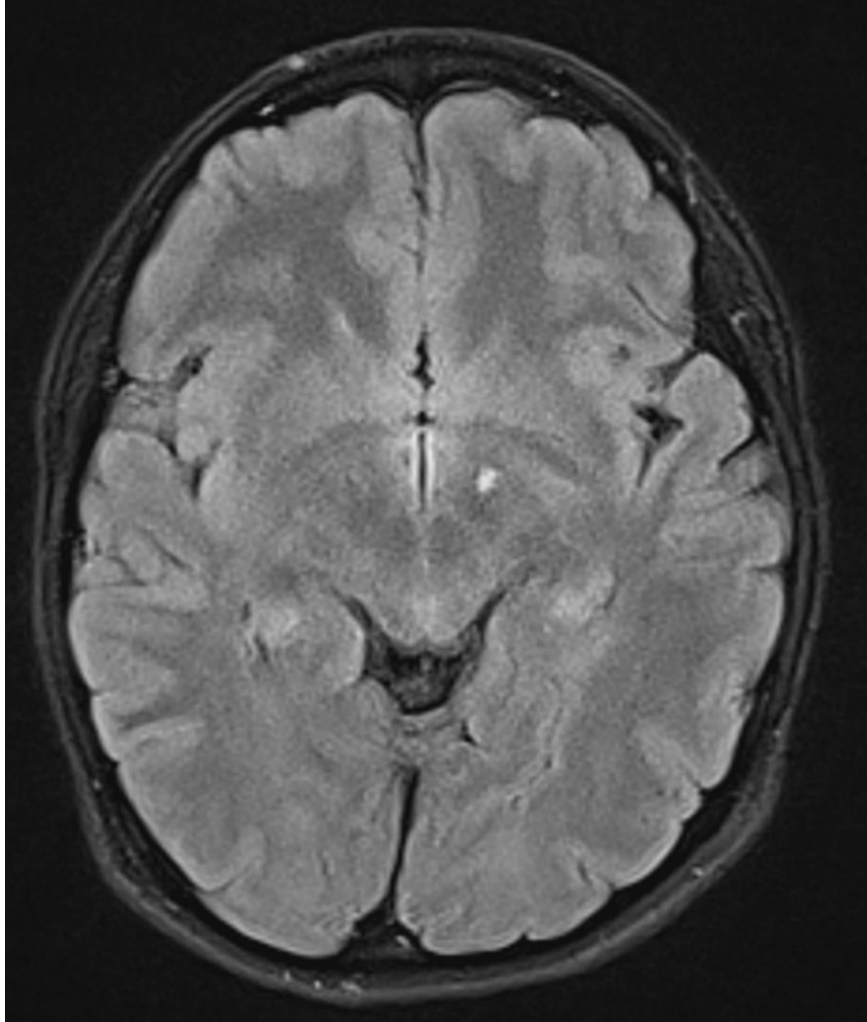


Figure 1: Axial T2 FLAIR image of small left neurofibroma.

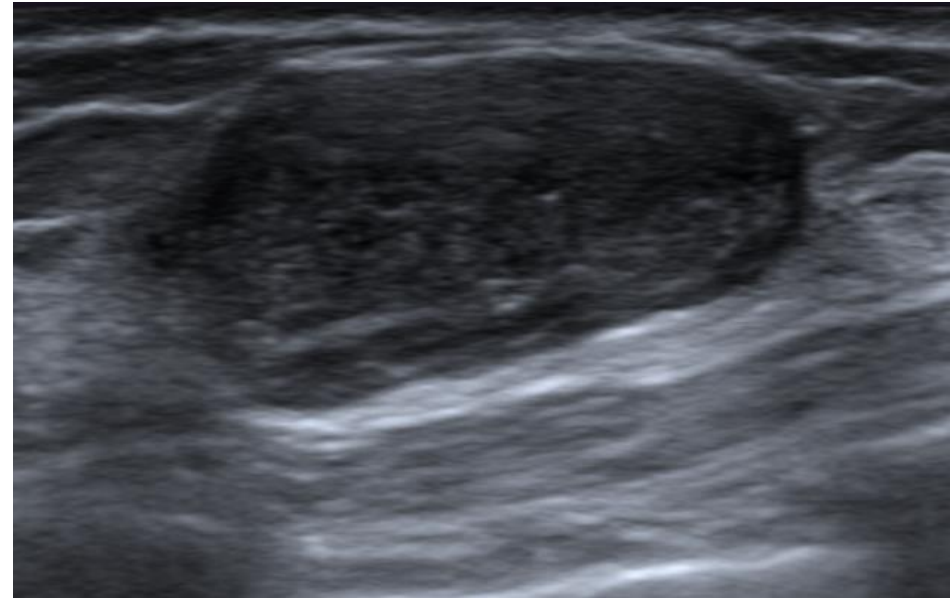


Figure 2: Axial ultrasound image of neurofibroma of the breast

Case presentation

- CT Urogram showed diffuse wall thickening and enhancement of the appendix, bulging into the caecum (Figure 3). No enlarged lymph nodes were demonstrated.
- Colonoscopy was arranged and biopsies were taken (Figure 4) which showed spindle shaped cell in keeping with Schwann cell lesion.
- Decision in colorectal MDT was to proceed with right hemicolectomy
- Final diagnosis was ganglioneuromatosis.

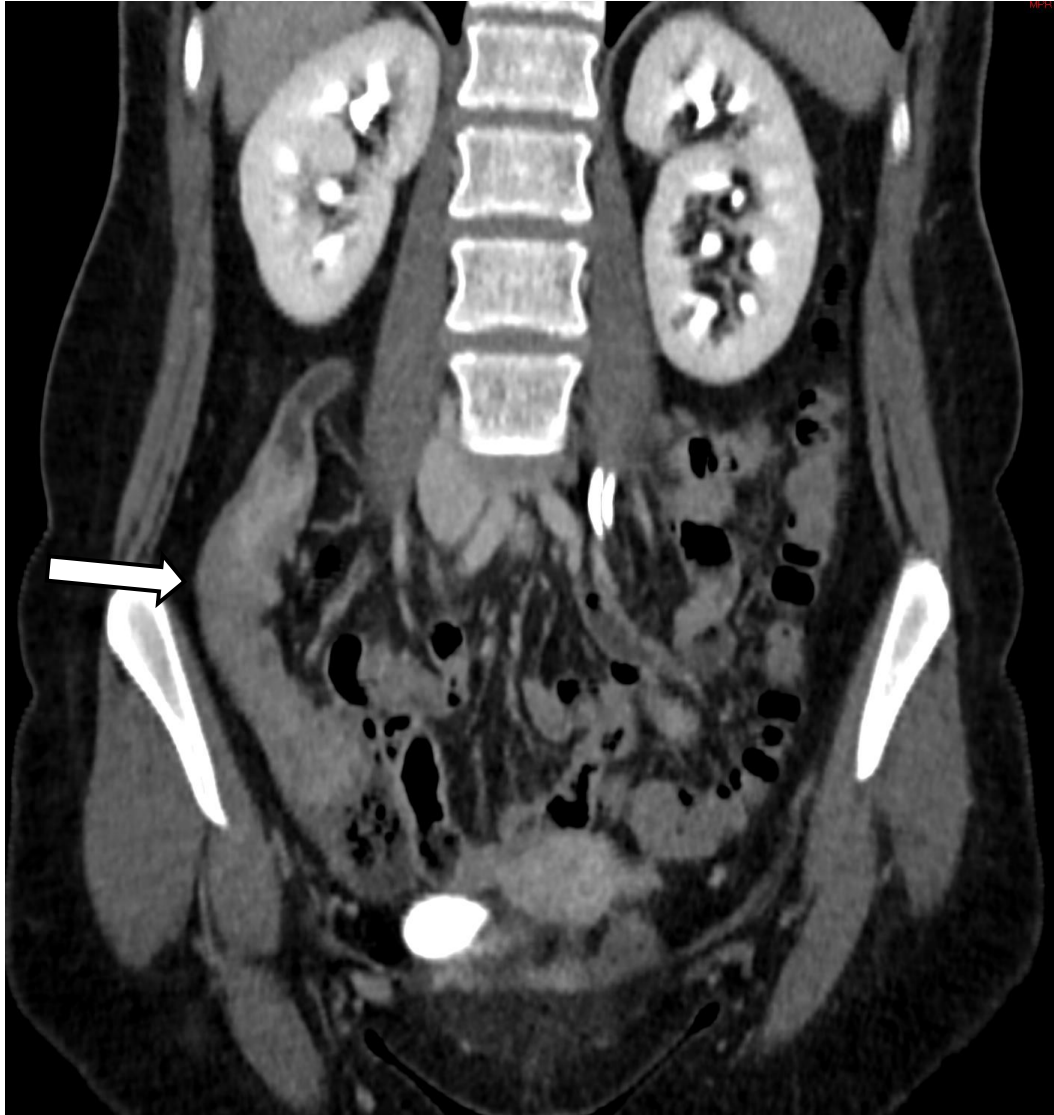


Figure 3: Axial and MPR reformatting of the appendicular mass

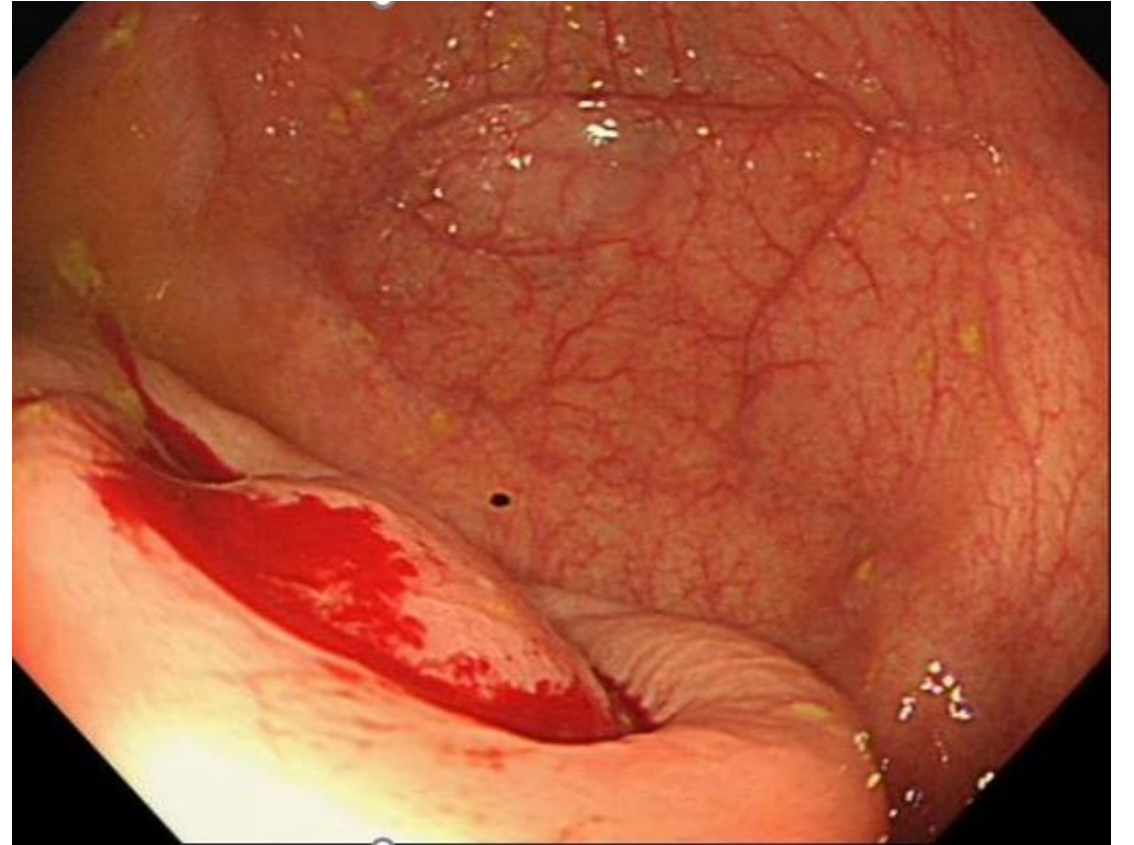
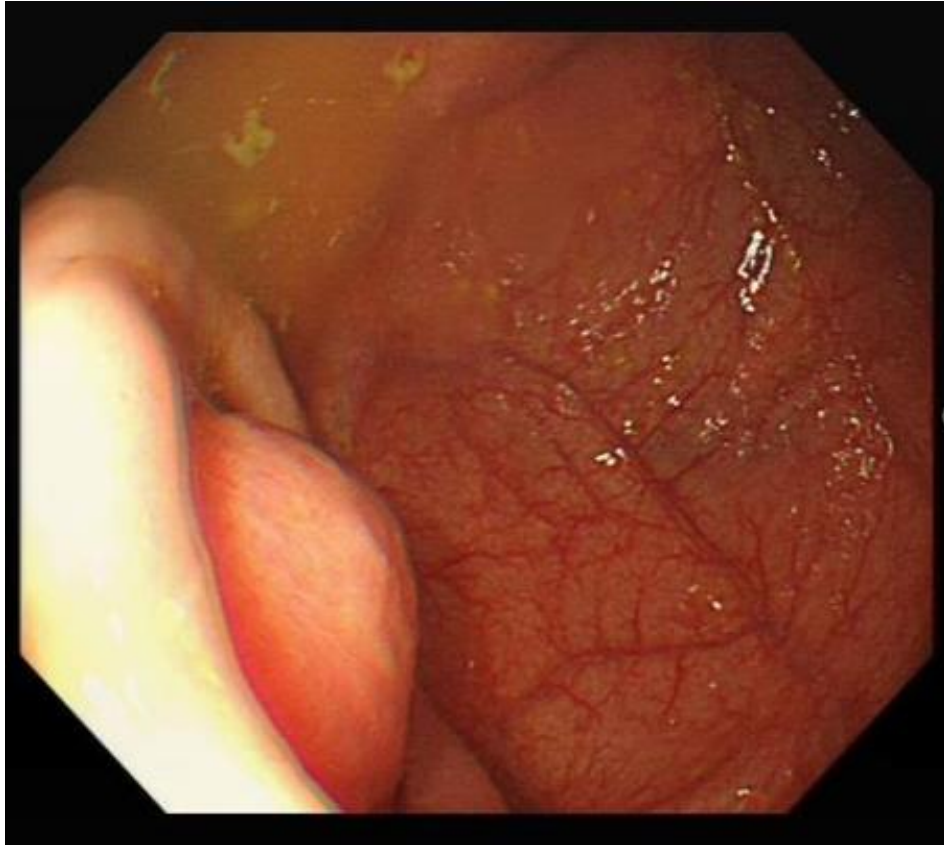


Figure 4: Endoscopic pictures of the appendicular lesion protruding through the appendicular opening into the caecum

List of reported cases of appendicular tumours in NF1: Neurofibromas represent the commonest pathology

No	Author	Year	Age	Gender	Main symptom	Preoperative diagnosis	Surgical procedure	Postoperative diagnosis	Size (cm)
1	Merck and Kindle[8]	1975	24	M	Abdominal pain	Appendicitis	Appendectomy	Neurofibromatosis	NA
2	Olsen[9]	1987	24	M	Abdominal pain	NA	Appendectomy	Neurofibroma	7 × 3
3	Samuel et al.[10]	1997	19	M	Abdominal pain	Appendicitis	Appendectomy	Neurofibromatosis	3 × 7 × 8
4	Eeden[11]	2000	47	M	Abdominal pain	Acute appendicitis	Appendectomy	Gangliocytic paraganglioma	20
5	Lockhert et al.[12]	2000	33	F	Abdominal pain	NA	Partial right colon resection	Ganglioneuroma	15 × 3
6	Rosenberg et al.[13]	2006	33	F	Asymptom	NA	Appendectomy	Neuroma	12
7	Agaimy et al.[14]	2010	45	M	NA	NA	Appendectomy	NA	0.3
8	Guo et al.[15]	2014	62	F	Abdominal pain	Fallopian tube tumor	Right hemicolectomy	Neurofibroma	9 × 7
9	Jeong et al.[16]	2014	61	M	Abdominal pain	Appendiceal mass	Partial cecum resection	Neurofibroma	NA
10	Ozaki et al. [17]	2015	51	M	Abdominal pain	Appendicitis	Appendectomy	Neurofibroma	3.5 × 2.5 × 2.5
11	Komo et al.[18]	2018	62	F	Asymptom	Cured appendicitis	Ceectomy	Neurofibroma	1.7 × 7
12	Steen et al.[19]	2020	74	M	Abdominal pain	Chronic appendicitis	Appendectomy	Neurofibroma	NA
13	Present case	2020	29	M	Asymptom	Appendiceal tumor	Appendectomy	Ganglioneuroma	5 × 3.5

(Shimizu et al, 2021)



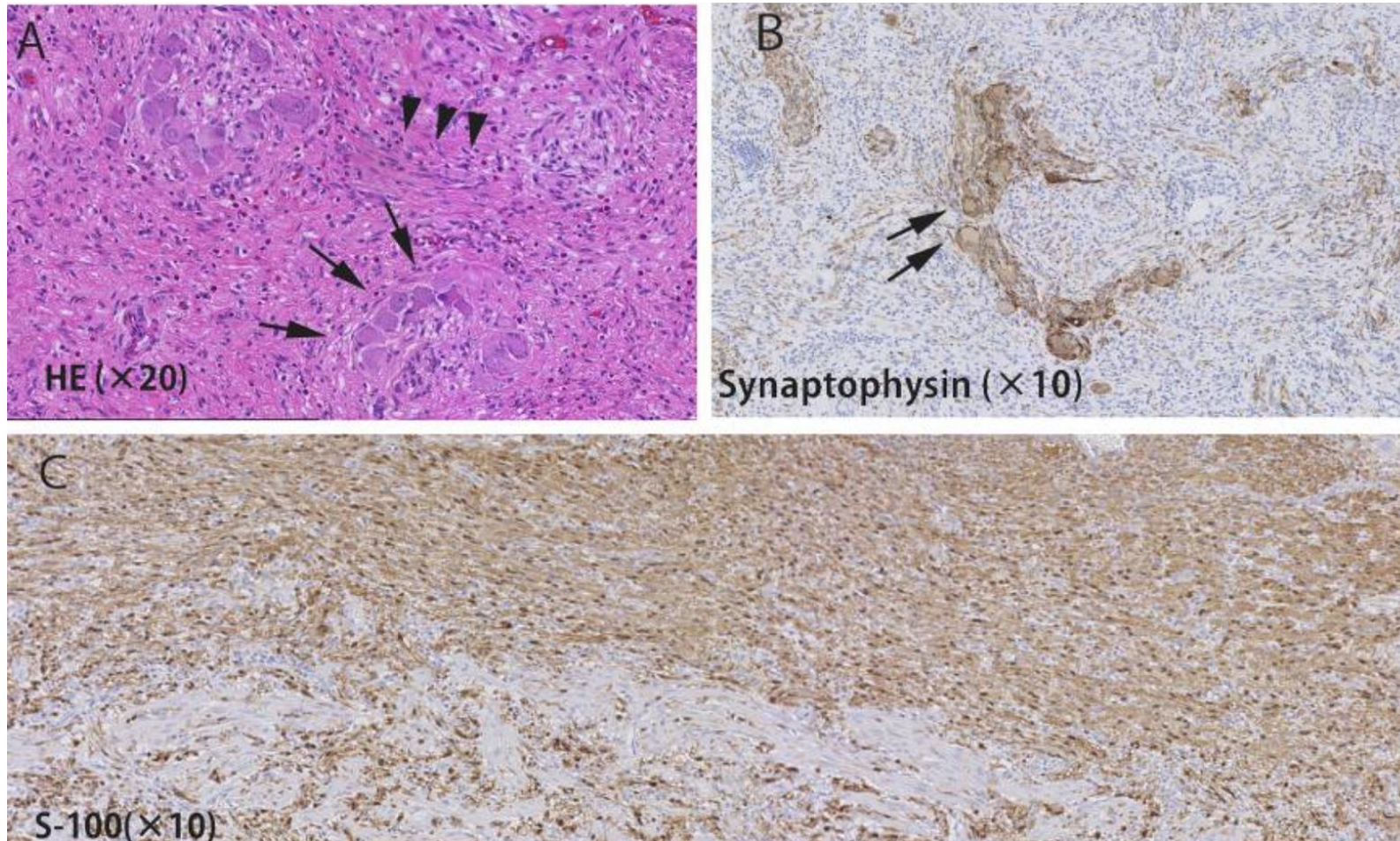
Extracted specimen showed thickening of the wall of the appendix

(Shimizu et al, 2021)

Gross pathologic specimen shows diffusely enlarged nodular appendix with muscular hypertrophy of wall, which contained multiple ganglioneuromas on histologic examination (black arrows) and adjacent plexiform neurofibroma (white arrow).



(Lockhart et al, 2000)



A Short spindle-shaped cells (neuron component: arrow heads) and round-shaped cell (ganglion cell: arrows) diffusely infiltrated the proper muscle layer, and fibrous tissue had grown around the nerve cells. B, C According to immunostaining, ganglion cells were positive for both S-100 C and synaptophysin (B), and neurons were positive for S-100 onl

(Shimizu et al, 2021)

Key learning points:

- Ganglioneuromatosis of the appendix is a rare diagnosis (with only two case reports previously in literature ^{1, 2}) and associated typically with NF1 and MEN-II B.
- The commonest appendicular tumour associated with NF1 are neurofibroma and GIST with the former at risk of sarcomatous changes. This would require surgical resection for pathological diagnosis and staging.
- Unlike retroperitoneal ganglioneuromatosis, the reported cases of appendicular lesions are benign with no required long term follow up.

References

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