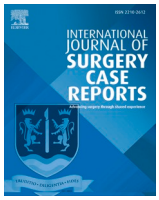
International Journal of Surgery Case Reports 95 (2022) 107260

Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.elsevier.com/locate/ijscr



Case report

A unique case report of three morphologically distinct malignancies in an appendix specimen

Rafid Rahman *, Alicia Walsh, Thomas Chase, Amir Ghanbari

Homerton University Hospital Foundation Trust, London, United Kingdom

ARTICLE INFO

Keywords:
Appendix
Malignancy
Neuroendocrine
Mucinous neoplasm
Adenocarcinoma

ABSTRACT

Introduction and importance: Appendiceal neoplasms have a diverse histological classification, the commonest type being neuro-endocrine neoplasm and accounting for 60% of all primary appendiceal malignancies. Others include colonic-type adenocarcinoma; mucinous neoplasm, and goblet cell carcinoma. This report describes a unique case of three different histological subtypes of appendiceal malignancy within a single specimen.

Case presentation: A 65-year-old female presented with symptoms concerning of GI malignancy and underwent computerised tomography pneumocolon showing an abnormally enhancing appendix concerning for an appendiceal tumour.

After multidisciplinary team discussion the patient underwent an open right hemicolectomy. Post-operative histological analysis showed complete resection of three distinct tumour subgroups within the specimen: a neuroendocrine tumour; a well-differentiated adenocarcinoma, and a low-grade appendiceal mucinous neoplasm.

Clinical discussion: This report describes, to our knowledge, the first documented case of three separate histological malignancies in a single appendix. Appendiceal malignancy is rare and there are less than 10 cases pertaining to the appendix in the literature: all describing dual neuroendocrine tumours and appendiceal mucinous neoplasms.

The case also highlights a limitation of colonoscopy in the diagnosis of colorectal malignancy, specifically for appendiceal tumours, and caution must be taken in discharging patients after a negative colonoscopy. A multidisciplinary approach is of utmost importance in managing these patients.

Conclusion: This is a rare case of 3 morphologically different neoplasms contained within one appendix and demonstrates the importance of an MDT approach to management of such cases. It also highlights the limitation of colonoscopy in diagnosis of appendiceal malignancy.

1. Introduction

Appendiceal malignancy is a rare subgroup of gastrointestinal (GI) malignancies, most-commonly diagnosed in a post-operative specimen taken after acute appendicitis [1]. Occasionally patients will be referred to the lower GI clinic with non-specific symptoms and found to have appendiceal cancer after further investigations including imaging and endoscopy. Whilst acute appendicitis carries a lifetime risk of 1 in 15 [2], appendiceal malignancy is estimated to affect 1.2 per 100,000 people [3].

There is a diverse histological classification of appendiceal malignancies, each with different staging systems, treatment and prognosis. Broadly, they may be classified as four different subtypes based on cellular origin: neuroendocrine tumour (NET); colonic-type adenocarcinoma; mucinous neoplasm, and goblet cell carcinoma [1]. The commonest type is neuro-endocrine neoplasm and this accounts for 60% of all primary appendiceal malignancies.

In this report we will describe the first documented case (to the authors' knowledge) of a patient diagnosed with 3 different histological subtypes of appendiceal malignancy within a single specimen. This case has been presented in line with the Surgical Case Report (SCARE) 2020 criteria [4].

2. Presentation of case

A 65 year old female presented to the emergency department (ED) of

* Corresponding author.
E-mail addresses: rafid.rahman@nhs.net (R. Rahman), amir.ghanbari@nhs.net (A. Ghanbari).

https://doi.org/10.1016/j.ijscr.2022.107260
Received 26 December 2021; Received in revised form 28 May 2022; Accepted 28 May 2022
Available online 31 May 2022

our district general hospital with a 2-week history of non-specific abdominal pain, vomiting and excessive belching. Past medical history included non-insulin dependent diabetes, hypercholesterolaemia, rheumatoid arthritis and hypertension. For this, the patient was taking oral anti-diabetic medication, statins, anti-hypertensives and had regular monoclonal antibody injections. She had previously had an open hysterectomy. Examination and blood tests were normal and she was referred urgently to the outpatient colorectal clinic for possible malignancy.

Of note, the patient had previously been investigated for colorectal malignancy two years before this presentation. She underwent computerised tomography (CT) of her chest, abdomen and pelvis- showing features suggestive of chronic inflammation in the caecum and ascending colon. As a result she underwent colonoscopy, which was normal- with random biopsies showing only microscopic inflammation. The patient was subsequently discharged back to the care of her general practitioner (GP).

On review in clinic, the patient reported intermittent left-sided, worsening abdominal pain over nine months. There was no change in her bowel habits or per rectal bleeding. She stated a history of weight loss but could not quantify this. There was no family history of colorectal malignancy. She was referred urgently for a CT pneumocolon, showing an abnormally enhancing appendix measuring up to 13 mm in diameter with small volume but prominent lymph nodes- concerning for an appendiceal tumour. CT chest showed no evidence of metastatic disease.

The case was discussed in the local multidisciplinary team (MDT) meeting and the patient was offered an open right hemicolectomy. She underwent an uncomplicated procedure (performed by author, AG) 8 weeks after her initial presentation to ED and was discharged on post-operative day 5.

Gross pathological analysis showed a dilated, firm appendix with no evidence of serosal disease. Histological analysis of the specimen revealed three morphologically separate lesions found within the appendix- a neuroendocrine tumour; a well-differentiated adenocarcinoma, and a low-grade appendiceal mucinous neoplasm.

The neuroendocrine tumour was a 2 mm neoplasm found in the distal third of the appendix. Cells were positive for neuroendocrine markers CD56, synaptophysin, chromogranin-A and CEAm. It was classified as a grade 1, pT1, pN0 neuroendocrine tumour which was fully resected.

The adenocarcinoma was found within a sessile serrate lesion based in the luminal epithelium. There was loss of MLH1 expression in immunohistochemistry and appearances were in keeping with well-differentiated adenocarcinoma arising in a sessile serrated lesion with dysplasia invading the muscularis propria. There was no vascular or perineural invasion. It was classified as pT2 pN0 and fully resected.

The mucinous neoplasm consisted of several large cyst-like structures lined by single layered cylindrical epithelium with no serration. The lumen contained mucin and they were devoid of lamina propria. Appearances were in keeping with a low-grade appendiceal mucinous neoplasm (LAMN) which was confined to the muscularis propria. It was classified as pT2 N0.

Immunohistochemistry showed both the sessile serrated lesion and the LAMN to be positive for CDX2 and CK20 whilst CD10 and CK7 were negative. Thirteen lymph nodes were retrieved and none of these showed any metastatic deposits.

3. Discussion

This report describes, to our knowledge, the first documented case of three separate histological malignancies in a single appendix. The term ‘collision tumour’ has been coined for cases of two tumours found in the same specimen and there are less than 10 cases pertaining to the appendix in the literature: all describing dual NET and LAMN [5]. Appendiceal malignancy is rare in itself and the distinct subgroups of cells found in the appendix can give rise to these diverse and distinct tumours [1].

This patient was investigated for suspicious lower GI symptoms with the standard battery of investigations. Interestingly, the CT scan from two years before the diagnosis had suggested chronic inflammation in the right colon and this was verified through colonic biopsy (Fig. 1). It is difficult to hypothesise whether this chronic inflammation may have led to tumour proliferation or was incidental in finding, however there is clear association in other organs that chronic inflammation can lead to neoplasia.

Tissue biopsies from the entire appendix are not feasible endoscopically, which means that there is a greater role of CT pneumocolon - as was the case here. It also highlights a limitation of colonoscopy in the diagnosis of colorectal malignancy, and caution must be taken in discharging patients after a negative colonoscopy, without consideration of further investigation of a possible appendiceal tumour.

In this case, a decision was made to proceed directly to right hemicolectomy due to high suspicion of index in an otherwise normal colon; allowing effective diagnosis and treatment. Due to this unusual histology the patient was referred to 2 specialist centres for NET and LAMN management for discussion at their MDTs. There was no further follow up required for the NET and annual surveillance was recommended for the LAMN/adenocarcinoma. The differences in management of each histological subgroup have led to an altered surveillance program as each carries different risk of recurrence. The determining factor for close surveillance in this patient was the presence of adenocarcinoma, which has the highest risk of recurrence. Fortunately, this patient had no evidence of distant spread.

The patient remains well at 6 months post-operative follow-up with no evidence of recurrence.

4. Conclusion

This is a rare case of 3 morphologically different neoplasms contained within one appendix and demonstrates the importance of an MDT approach to management of such cases. It also highlights the limitation of colonoscopy in diagnosis of appendiceal malignancy.

Consent

Written informed consent was gained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-In-Chief of this journal on request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Ethical approval

In line with local guidelines.

Funding

N/A.

Guarantor

Amir Ghanbari.

Research registration number

Not applicable.

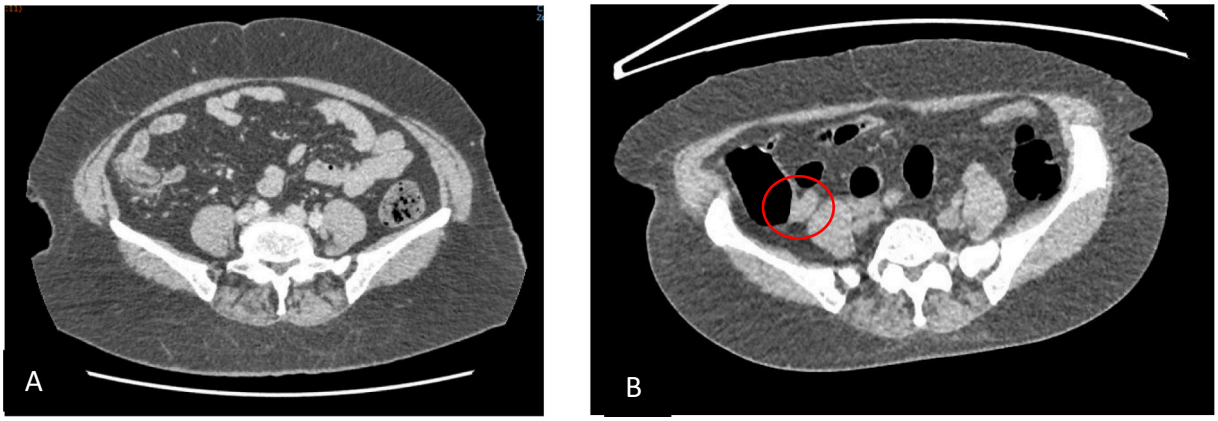


Fig. 1. A showing right colon inflammation on CT scan 2 years prior to diagnosis and B showing abnormal appendix from CT pneumocolon circled in red.

CRediT authorship contribution statement

Rafid Rahman (first author): conceptualisation; visualisation; writing - review and editing; resources.
Alicia Walsh: investigation; data curation; writing - original draft.
Thomas Chase: conceptualisation; writing - review and editing
Amir Ghanbari: conceptualisation; supervision.

Declaration of competing interest

Nil.

References

[1] M. Van de Moortele, M.G. De Hertogh, X. Sagaert, E. Van Cutsem, Appendiceal cancer: a review of the literature, Acta Gastroenterol. Belg. 83 (3) (2020) 441–448.
[2] M. Ferris, S. Quan, B.S. Kaplan, N. Molodecky, C.G. Ball, G.W. Chernoff, The global incidence of appendicitis, Available from: Ann. Surg. 266 (2) (2017 Aug 1) 237–241 https://journals.lww.com/annalsofsurgery/Fulltext/2017/08000/The_Global_Incidence_of_Appendicitis__A_Systematic.8.aspx.
[3] M.E. Mccusker, T.R. Coté, L.X. Clegg, L.H. Sobin, Primary Malignant Neoplasms of the Appendix, 2002.
[4] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, for the SCARE Group, The SCARE 2020 guideline: updating consensus Surgical CAse REport (SCARE) guidelines, Int. J. Surg. 84 (2020) 226–230.
[5] H.L. Tan, Tan GHC, M. Teo, Two rare cases of appendiceal collision tumours involving an appendiceal mucinous neoplasm and carcinoid, Available from: BMJ Case Rep. (2016 Feb 1) 2016 https://pubmed.ncbi.nlm.nih.gov/26833956/.