Neuroendocrine tumor in a long-standing tailgut cyst: a case report

Mirella Pace[1*], Raduan Ahmed Franca[1], Pasquale Cretella[1], Maria Michela Di Nuzzo[2], Roberto Peltrini[2], Michele D'ambra[2], Maria Laura Del Basso De Caro[1], Maria Rosaria D'Armiento[2]

European Journal of Medical Case Reports
Volume 6(7):119–122
https://doi.org/10.24911/ejmcr/173-1650278347

ABSTRACT

Background: Retrocecal hamartomas are rare cystic lesions due to the persistence of the tailgut. Sometimes the epithelial or mesenchymal components of the cyst wall undergo neoplastic transformation, and, within them, carcinomas and sarcomas can develop.

Case Presentation: We present the case of a multicystic lesion, discovered in a patient with perineal pain, which the imaging investigations have localized in the retrocecal space. The histological evaluation performed on his excisional biopsy demonstrates a retrocecal hamartoma harboring a neuroendocrine neoplasm.

Conclusion: Tailgut cysts (TGC) are quite rare, only sometimes symptomatic, and infrequently, they also undergo a malignant transformation; in particular, the literature reviews report a higher frequency of adenocarcinomas.

The differential diagnosis between lesions with different prognoses and pathogenesis that can develop in the retrocecal space requires a histological examination, which in some cases, becomes essential if we consider the potential for metastatic and local recurrence of any malignant neoplasm that arose in this site.

Keywords: Neuroendocrine tumor, retrorectal hamartoma, tail-gut.

Received: 18 April 2022 **Accepted:** 17 October 2022 **Type of Article:** CASE REPORT **Specialty:** Pathology

Correspondence to: Mirella Pace
*Department of Biomorfological and Functional Sciences, University of Naples Federico II, Naples, Italy.
Email: pacemirella@virgilio.it
Full list of author information is available at the end of the article.

Background

The retrocecal space is a complex deep anatomical area consisting of several structures and tissues developing from different embryonic layers. The tailgut represents the most caudal portion of the hindgut, caudal to the embryonic anus and it is located in the post-cloacal area. Around the eighth week of embryonic life, concurrently with the disappearance of the other embryonic tail structures, it is generally regressed by apoptosis.

Tailgut cyst (TGC), also known as retrocecal hamartoma, is a benign cystic lesion of the presacral space derived from the persistence of tailgut remnant; it is regarded as a congenital malformation, and it represents the most frequent presacral tumor in adult life.

Neoplastic transformation of the cyst-lining epithelium is a rare event and often occurs in the form of adenocarcinoma or neuroendocrine neoplasia and in this case the symptoms may derive from the invasion of nearby organs or from the presence of distant metastases [1-3].

Case Presentation

A 48-year-old man with pelvic and perianal pain, also with constipation, visited our Gastroenterology Clinic. The rectal examination revealed a painless retrocecal mass.

On magnetic resonance imaging, an expansive process, medially seated in presacral space and adhering to the sacrococcygeal and the mesorectal fascia was observed. It showed a mixed solid-cystic aspect and imprinted the rectal wall (Figure 1).

An excisional was performed and was brought to our institute with the diagnostic suspicion of a pelvic floor cyst presented as an expansive process of the mesorectal area.

On gross examination, the maximum size was 5 cm, and the cut surface showed a multiloculated cyst close to a white solid-looking area measuring approximately 3 cm in maximum diameter.

Microscopic evaluation of the solid area showed histological features of a well-differentiated neuroendocrine

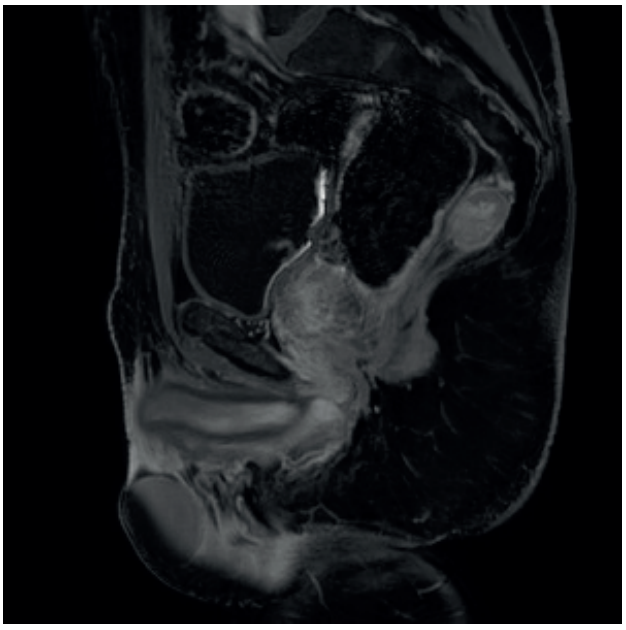

Figure 1. *Sagittal view on MRI of a multiloculated/solid paramedian retrorectal neoplasm in DWI/DSI sequences. Here is shown a multicystic oval lesion with a solid portion located in the soft tissues between the cecum and the sacrum.*

tumor composed of a proliferation of medium-sized cells with an organoid growth pattern, organized into nests and cords, with some images of perineural invasion. The cells showed finely blunt chromatin and stained positive for chromogranin A, synaptophysin, and pan-cytokeratin (AE1-AE3 cytokeratin). The KI-67/MIB-1 Labelling Index was between 5% and 10%, favoring the diagnosis of well-differentiated neuroendocrine tumor (G2), according to the WHO classification system of neuroendocrine neoplasms.

As for the cystic component, the lumens are lined with stratified squamous mixed with pseudostratified cylindrical and flattened enteric epithelia, filled with an inconsistent fluid, lightly eosinophilic, and stromal walls contain small bundles of disorganized smooth muscle fibers (Figure 2).

The neoplasm was completely excised and the patient went in good health.

Discussion

The modeling processes of the posterior portion of the embryo are guided by the posterior bud, a structure of the mesoderm that allows the correct development of the tail and actively gave rise to the notochord, the spinal cord, hindgut, and cloaca, also thanks to the formation of the caudal intestinal portal. The tailgut, in the human embryo and many other invertebrates, undergo an arrest of development and apoptotic degeneration within the 8 mm stage. An association between TGC and sacrococcygeal abnormalities has been observed and a reasonable explanation might lie in the complex events mentioned above [4,5].

By themselves, retrocecal tumors are rare entities and, among them, retrocecal hamartomas are quite rare. They are generally discovered in adulthood and are more common in females and are manifested by the appearance of symptoms due to the compression of the surrounding structures and/or pain [6,7].

The diagnosis of TGC remains exclusively histological. The largest of the case series on retrocecal hamartomas defines them as multiloculated masses, with clear fluid content and with a variable mixture of epithelial lining; the last recapitulates the cloacal or the gastro-intestinal and urinary fetal epithelium, being columnar with goblet cells, cuboidal, multilayered columnar, squamous, multilayered, or transitional. The salient feature lies in the presence of more or less thick bundles of smooth muscle fibers, arranged in a circumferential orientation around the mass. The myenteric plexuses are absent, and all these features precisely distinguish these cystic masses from other typical midline neoformations that may develop in the same space (i.e., epidermal cyst/dermal cyst, teratoma, rectal duplication cyst, Mullerian cyst, anal gland cyst, anterior sacral meningocele, cystic chordoma, cystic lymphangioma, etc.) leading to a differential diagnosis that could not otherwise be done with radiological assessments alone [8,9].

One of the reasons why a surgical excision of this type of embryonic rest is mandatory is that a high incidence of malignant transformation has been proven, about 26% of cases, according to Nicoll et al. [10] but even higher (31.1%) if we consider Mastoraki's et al. [7] recent review. Malignant neoplasms seem to develop mainly in males and most frequently, they occur in the form of adenocarcinoma (43%) or neuroendocrine neoplasia (39.2%).

They can harbor adenocarcinomas, neuroendocrine neoplasms, urothelial carcinomas, and sarcomas as with those of colic origin, for adenocarcinomas, a cancerization process appears to be possible via dysplasia/carcinoma sequence [11].

A recent review of the English literature reports that only 29 cases of neuroendocrine tumors have arisen in a retrocecal hamartoma. They arise from cells of the diffuse neuroendocrine system, found in the glandular epithelium of the tailgut, and suggest that the most likely derivation is from hindgut rests. Some authors linked that their development may be associated with estrogen stimulation and found estrogen receptor expression in neuroendocrine cells [12].

Two of the reviewed cases were already metastatic at the time of diagnosis, six developed metastases after surgical removal, and in some of the cases, there was a recurrence at the site of excision [13-16].

Prognostic factors have not yet been correctly defined, certainly due to the exceptional nature of the event. Some neuroendocrine neoplasms invaded the structures already at diagnosis, others were already metastatic and

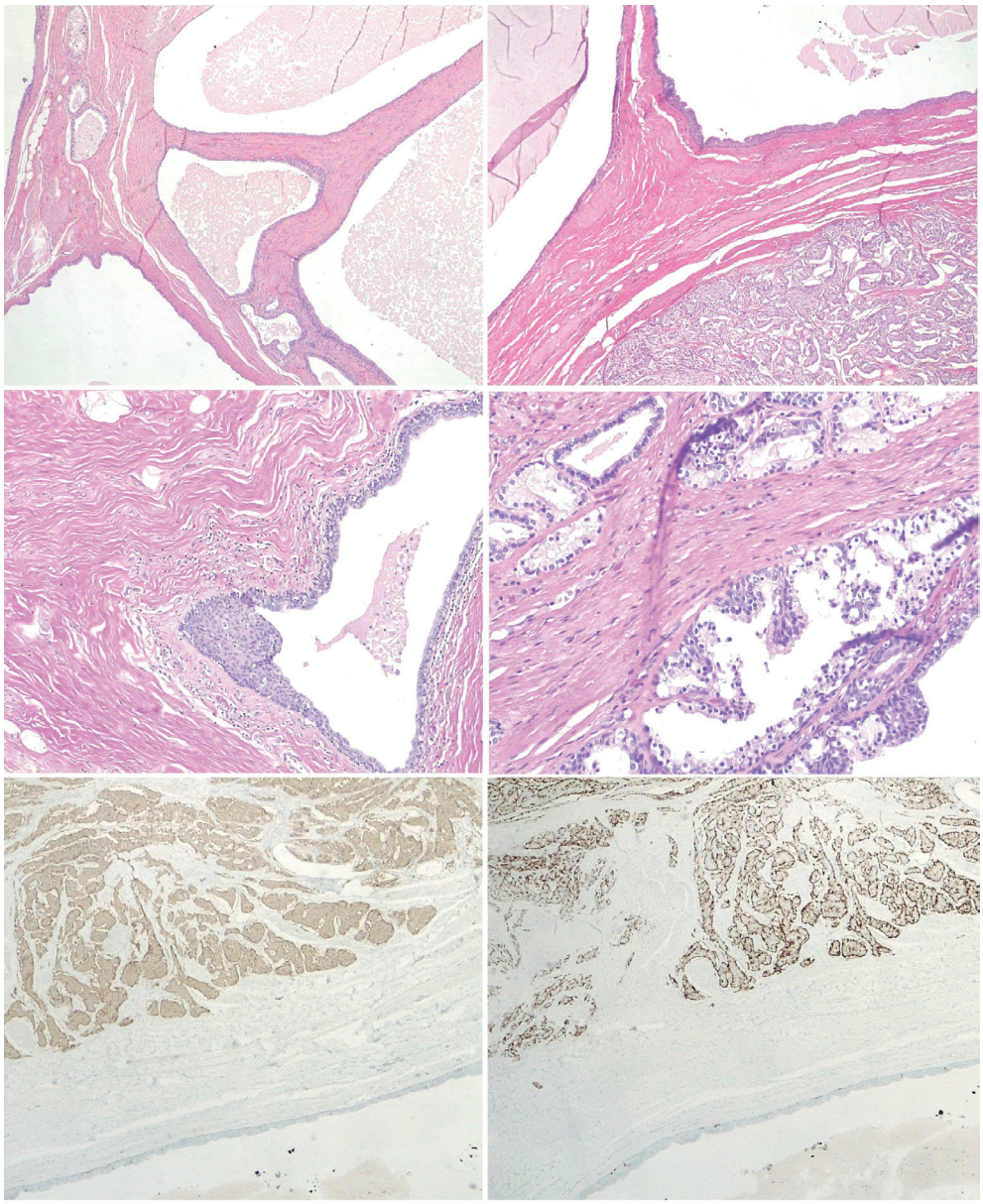

Figure 2. *(A, B, and D) multiloculated cyst with immature intestinal mucosecerning, columnar, epithelial lining, and the parietal muscle cells are organized in circumferential bundles. (C) Squamous epithelial lining of a little space. In B, below the two lumens, the area with a solid appearance at gross examination corresponds to a neoplasm with organoid growth, consisting of nests and bundles of small monomorphic cells with low mitotic count [Hematoxylin & Eosin 5× High Power Field (HPF)]. The neuroendocrine nature of the solid neoplasm described above is confirmed by the expression of Synaptophysin (E) and Chromogranin (F) (E-F: Immunohistochemistry for Synaptophysin and Chromogranin 10× HPF).*

seemed neuroendocrine neoplasms [16], and it seems that Grade 2 or 3 tumors show disease progression even after surgery [17]

Conclusion

In this case report, we focus on a rare pathology that has been a diagnostic challenge for us. Complete surgical resection is always the desirable choice due to the importance of correct classification of the multiloculate mass and the eventual definition of accompanying malignancy. This could have an implication on prognosis and response to patient treatment as well as follow-up management.

What is new?

The authors provide a radiological and histological study of a diagnostical challenging case underlining the difficulty of radiological imaging to evaluate the real nature of retrocecal neoplasms and the role of surgical pathologists to detect its correct definition.

List of Abbreviations

TGC Tail Gut Cyst
WHO World Health Organization
HPF High Power Field

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Funding

No funding to declare.

Consent for publication

Written informed consent was taken from the patient.

Ethical approval

Ethical approval is not required at our institution to publish an anonymous case report.

Author details

Mirella Pace[1], Raduan Ahmed Franca[1], Pasquale Cretella[1], Maria Michela Di Nuzzo[2], Roberto Peltrini[2], Michele D'ambra[2], Maria Laura Del Basso De Caro[1], Maria Rosaria D'Armiento[2]

1. Department of Biomorfological and Functional Sciences, University of Naples Federico II, Naples, Italy
2. Department of Public Health, University of Naples Federico II, Naples, Italy

References

1. Tampi C, Lotwala V, Lakdawala M, Coelho K. Retrorectal cyst hamartoma (tailgut cyst) with malignant transformation. Gynecol Oncol. 2007;105:266–8. https://doi.org/10.1016/j.ygyno.2007.01.008
2. Lev-Chelouche D, Gutman M, Goldman G, Even-Sapir E, Meller I, Issakov J, et al. Presacral tumors: a practical classification and treatment of a unique and heterogeneous group of diseases. Surgery. 2003;133(5):473–8. https://doi.org/10.1067/msy.2003.118
3. Haydar M, Griepentrog K. Tailgut cyst: a case report and literature review. Int J Surg Case Rep. 2015;10:166–8. https://doi.org/10.1016/j.ijscr.2015.03.031
4. Hashimoto R. Development of the human tail bud and splanchnic mesenchyme. Congenit Anom (Kyoto). 2013;53(1):27–33. https://doi.org/10.1111/j.1741-4520.2012.00387.x
5. de Santa Barbara P, Roberts DJ. Tail gut endoderm and gut/genitourinary/tail development: a new tissue-specific role for Hoxa13. Development. 2002;129(3):551–61. https://doi.org/10.1242/dev.129.3.551
6. Jao SW, Beart RW Jr, Spencer RJ, Reiman HM, Ilstrup DM. Retrorectal tumors. Mayo clinic experience, 1960-1979. Dis Colon Rectum. 1985;28(9):644–52. https://doi.org/10.1007/BF02553440
7. Mastoraki A, Giannakodimos I, Panagiotou K, Frountzas M, Chrysikos D, Kykalos, S. et al. Epidemiology, diagnostic approach and therapeutic management of tailgut cysts: a systematic review. Int J Clin Pract. 2021;75. https://doi.org/10.1111/ijcp.14546
8. Hjermstad BM, Helwig EB. Tailgut cysts. Report of 53 cases. Am J Clin Pathol. 1988;89(2):139–47. https://doi.org/10.1093/ajcp/89.2.139
9. Dahan H, Arrivé L, Wendum D, Docou le Pointe H, Djouhri H, Tubiana JM. Retrorectal developmental cysts in adults: clinical and radiologic-histopathologic review, differential diagnosis, and treatment. Radiographics. 2001;21(3):575–84. https://doi.org/10.1148/radiographics.21.3.g01ma13575
10. Nicoll K, Bartrop C, Walsh S, Foster R, Duncan G, Payne C, et al. Malignant transformation of tailgut cysts is significantly higher than previously reported: systematic review of cases in the literature. Colorectal Dis. 2019;21(8):869–78. https://doi.org/10.1111/codi.14628
11. Moreira AL, Scholes JV, Boppana S, Melamed J. p53 Mutation in adenocarcinoma arising in retrorectal cyst hamartoma (tailgut cyst): report of 2 cases--an immunohistochemistry/immunoperoxidase study. Arch Pathol Lab Med. 2001;125(10):1361–4. https://doi.org/10.5858/2001-125-1361-PMIAAI
12. Liang JJ, Alrawi S, Fuller GN, Tan D. Carcinoid tumors arising in tailgut cysts may be associated with estrogen receptor status: case report and review of the literature. Int J Clin Exp Pathol. 2008;1(6):539–43.
13. Lee A, Suhardja TS, Nguyen TC, Teoh WM. Neuroendocrine tumour developing within a long-standing tailgut cyst: case report and review of the literature. Clin J Gastroenterol. 2019;12(6):539–51. https://doi.org/10.1007/s12328-019-00998-4
14. Horenstein MG, Erlandson RA, Gonzalez-Cueto DM, Rosai J. Presacral carcinoid tumors: report of three cases and review of the literature. Am J Surg Pathol. 1998;22(2):251–5. https://doi.org/10.1097/00000478-199802000-00015
15. Rosai J. The origin of neuroendocrine tumors and the neural crest saga. Mod Pathol. 2011;24 Suppl 2:S53–7. https://doi.org/10.1038/modpathol.2010.166
16. Iwata E, Orosz Z, Teh J, Reynolds J, Whitwell D, Tanaka Y, et al. Neuroendocrine tumor arising in a tailgut cyst: a rare presacral tumor. Int J Surg Pathol. 2019;27(3):336–42. https://doi.org/10.1177/1066896918796291
17. Mitsuyama T, Kubota M, Nakamura Y, Yuzurihara M, Hoshi K, Okada Y. Neuroendocrine tumor arising from tailgut cyst with spinal cord tethering: case report and literature review. Spine J. 2015;15(2):e1–8. https://doi.org/10.1016/j.spinee.2014.09.027

Summary of the case

1	**Patient (gender, age)**	Male, 48 years
2	**Final diagnosis**	Neuroendocrine tumor arised in a tailgut cyst
3	**Symptoms**	Pelvic and perianal pain, constipation
4	**Medications**	Surgical procedure to obtain excisional biopsy
5	**Clinical procedure**	N\A
6	**Specialty**	Surgical pathology