68815_Auto_Edited-check.docx

WORD COUNT	2376	TIME SUBMITTED	15-SEP-2021 10:43PM
		PAPER ID	76673236

Name of Journal: *World Journal of Clinical Cases*

Manuscript NO: 68815

Manuscript Type: CASE REPORT

Rectal mature teratoma: A case report

Liu JL *et al*. Rectal mature teratoma

Jia-Li Liu, Ping-Liang Sun

Abstract

BACKGROUND

Rectal mature teratoma is rare and has been reported as a case report in this study. Herein, clinical presentation, magnetic resonance imaging findings, and immunohistochemistry showed a pelvic rectal mature teratoma. The case report and the surgical treatment procedure have been discussed below.

CASE SUMMARY

A 29-year-old Chinese female showed up with over a one-month history of perianal mass that emerged after defecation. Physical examination indicated that the mass was 4 cm × 3 cm × 3 cm. The intraoperative procedure involved ligation of the sigmoid colon 10 cm above the upper edge of the tumor, followed by ligation of the rectum 3.5 cm above the upper edge of the tumor, and subsequent complete removal of the mass. The histopathology confirmed the mature teratoma.

CONCLUSION

The tumor can be completely removed using surgery to prevent its recurrence.

Key Words: Rectal; Mature teratoma; Therapy; Csae report

Liu JL, Sun PL. Rectal mature teratoma: A case report and review of the literature. *World J Clin Cases* 2021; In press

Core Tip: Herein, a rectal mature teratoma patient is reported. However, only a few similar cases have been reported. Currently, it is difficult to diagnose mature rectal teratoma using a computed tomography scan. However, complete removal of the tumor using surgery can prevent its recurrence.

INTRODUCTION

Teratoma is a tumor caused by pluripotent cells, especially the embryonic stem or seed cells in the gonad or embryonic part of the body. It occurs in the midline or on both sides of the body. It often originates from the Hensen's node, （the location of pluripotent stem cells. Teratoma also occurs in the sacral region, where pluripotent cells are also located[1]. Teratoma is mostly benign with low malignant potential, but it can also develop into a malignancy[2]. Rectal teratoma is rare, and there are few reports worldwide. Mature teratoma is a benign tumor(dermoid cyst) and accounts for over 95% of teratomas. Mature teratoma mostly occurs in women of childbearing age, and sometimes in young girls and postmenopausal women. It rarely occurs in males [3]. This study aimed to review the diagnosis and treatment of rectal teratoma and to determine the clinical characteristics associated with this rare tumor.

CASE PRESENTATION

Chief complaints

A 29 -year-old female, G1P0, with over one-month history of a perianal mass out after defecation, was hospitalized in the First Affiliated Hospital of Guangxi Chinese Medicine University.

History of present illness

She reported a one-month medical history of perianal mass out after defecation and also complained about the anal bulge. The patient had not used contraceptives, was not injured, had no pain, chills, or fever, and no difficulty during defecation.

History of past illness

The patient had not past illness.

Personal and family history

The patient had a history of artificial abortion and no family history of Rectal mature teratoma. The condition was diagnosed as a rectal mass (nature to be investigated).

Physical examination

The mass was 4 cm × 3 cm × 3 cm inside the anus with a dentate line distance of about 6 cm and was smooth upon palliation, and non-tender mass was seen outside the anus.

Laboratory examinations

Hematological examinations, including serum electrolyte levels, human chorionic gonadotropin, comprehensive metabolic panel, and complete blood count, were normal.

Imaging examinations

Electronic colonoscopy: Rectal mass (nature to be investigated) (Figure 1).

The computed tomography (CT) scan revealed: (1) A 6.3 cm × 4.7 cm × 5.1 cm round mass, flaky low-density shadow and calcification on center, enhanced scanning lesions with circular mild enhancement, non-enhancement on center, and clear boundary on pelvic(unclear if this is a teratoma); and (2) Double-sided adnexal area low-density shadow(cyst) (Figure 2).

A rectal mass resection was performed *via* laparoscopic under anesthesia to alleviate the patient's symptoms.

FINAL DIAGNOSIS

The condition was diagnosed as mature rectal teratoma based on the above physical examinations and imaging data.

TREATMENT

Surgical procedure

A rectal mass resection was conducted *via* laparoscopy under anesthesia. Intraoperative ligation was conducted on the sigmoid colon 10 cm above the upper edge of the tumor and on the rectal 3.5 cm above the upper edge of the tumor, followed by complete removal of the mass. Full hemostasis, sigmoid colon and rectal suture repair, placement of a negative pressure drainage tube in the anus and abdominal cavity, and layer-by-layer suture repair of the incision was then conducted (Figure 3).

Pathological examination

In the intestinal section, two connected tumors, about 6 cm × 5 cm × 4 cm mass and 2 cm × 2 cm × 2 cm mass, were seen in the intestinal mucosa and intestinal serosal layer, respectively. In the microscopic view, skin and appendages, glands, fat, bone tissue, bone marrow tissue, and brain tissue indicated mature teratoma. No tumor tissue was seen at the two ends (upper and lower margins) after the examination. Six lymph nodes were found, and no tumor metastasis was identified (0/6). Therefore, the condition was diagnosed as mature teratoma (Figure 4).

OUTCOME AND FOLLOW-UP

Postoperatively, the patient was discharged after healing. She returned for a follow-up in August 2018. On examination, there was evident wound healing and no tumor

recurrence. Additionally, the patient was free of discomfort, pain, and fecal incontinence.

The colonoscopy and CT scan revealed a rectal mass, 6 cm × 5 cm × 4 cm in intestinal mucosa and 2 cm × 2 cm × 2 cm in the intestinal serosal layer, which was diagnosed as mature rectal teratoma. Laparoscopic tumor resection was conducted to remove the tumor. No tumor metastasis was found six months after successful 1-mo treatment. The teratoma was located in the rectal wall, which is close to the pelvic cavity. The teratoma volume increases and breaks into the intestinal wall, ad bulging to the posterior wall of the rectum. The teratoma then comes out of the anus and can only be returned by hand.

DISCUSSION

Clinical reports of teratoma are common in the sacrococcygeal, appendix, ovary, testis, retroperitoneum, mediastinum, *etc.* Several studies have shown that the incidence of teratoma may be related to various factors, such as genetic, environmental, and gene-level regulation[4,5]. Teratoma can be divided into benign and malignant transformations based on the degree of tissue differentiation. Teratoma incidence is about 1:35000-1:40000[6] and mostly occurs in women (the ratio of male to female is about 1:2-4) with few occurrences in children and postmenopausal women[7,8]. Although mostly reported in the ovary and testis, it also occurs in the midline of the mediastinum, appendix, sacrococcygeal, pineal body, mediastinum, posterior peritoneal cavity, omentum, uterine rectum, vagina, and cervix[9-12]. Immature teratomas occur in adolescents. Most malignancies transform into cancer (squamous cell carcinoma). About 1%-2% of teratoma cases are malignant and are common in young women (the average age of onset, 11 to 19 years) with poor prognosis[13-15]. CT images of mature teratoma reveal calcification, adipose tissue, bone, tooth, and Obviously cyst[16,17].

CT scan is sensitive to calcification and fat, common and quick, combined with enhanced scan can evaluate the soft tissue composition well, but lacks specificity for differentiating between tumor types. While MRI has a higher resolution of fat, soft tissue, which helps to determine the retrorectal tumors and their relationships of

surrounding structures and cystic degeneration, but shows poorly for calcification[18,19]. To some extent, MRI is more accurate than CT to estimate the possible complications such as torsion, rupture, and malignant transformation.

Badmos reported that laparoscopic surgery can enlarge the field of view, reducing the incision and intraoperative blood loss[20]. Lee *et al*[21] also reported that laparoscopic surgery could significantly reduce the body's inflammatory response compared to open surgery. Tharintorn reported a case of complicated duodenal mature teratoma, which was resected *via* laparoscopic surgery[22]. Herein, the mature cystic teratoma was identified, and the patient was discharged after the operation. No recurrence occurred after six months of follow-up. Laparoscopic pelvic and teratogenic teratoma surgery is widely used because of the minimally invasive advantages. Laparoscopic surgery completely removes the tumor without damaging adjacent tissues and organs, avoiding the rupture of the tumor and preventing leakage of the teratoma, thus inhibiting malignant transformation, recurrence, and metastasis[23,24].

Murdock and Abbas[25] reported that an anorectal cystic teratoma transabdominal approach is necessary, which can be done laparoscopically safely and successfully, even for a large lesion.

Wang *et al*[26] reported that generally not recommended to use preoperative biopsy of retrorectal tumors because of the risk of infection or tumor seeding in the pelvis. As such, a definitive diagnosis is best to obtain by following complete resection of the tumor. Resection of retrorectal teratoma is generally regarded as appropriate because of the malignant potential.

Aiken *et al*[27] reported that the diagnosis can be made with endoscopy alone by the presence of hair over the mass.

Nam and Kim[28] reported that the mass was removed by polypectomy because of patient's lesion was a pedunculate polyp measuring approximately 4cm located approximately 15cm from the anal, endoscopic resection was performed to make a diagnosis. Endoscopic resection is indicated for a pedunculate polyp that measures < 4 cm. If the diagnosis is unclear or malignancy cannot be excluded, surgical resection is

preferable. The summaries of reported cases of rectal mature teratoma are shown in Table 1.

CONCLUSION

REFERENCES

1 **Yoon HM**, Byeon SJ, Hwang JY, Kim JR, Jung AY, Lee JS, Yoon HK, Cho YA. Sacrococcygeal teratomas in newborns: a comprehensive review for the radiologists. *Acta Radiol* 2018; **59**: 236-246 [PMID: 28530139 DOI: 10.1177/0284185117710680]

2 **Gatcombe HG**, Assikis V, Kooby D, Johnstone PA. Primary retroperitoneal teratomas: a review of the literature. *J Surg Oncol* 2004; **86**: 107-113 [PMID: 15112254 DOI: 10.1002/jso.20043]

3 **Patel MD**, Feldstein VA, Lipson SD, Chen DC, Filly RA. Cystic teratomas of the ovary: diagnostic value of sonography. *AJR Am J Roentgenol* 1998; **171**: 1061-1065 [PMID: 9762997 DOI: 10.2214/ajr.171.4.9762997]

4 **Prener A**, Engholm G, Jensen OM. Genital anomalies and risk for testicular cancer in Danish men. *Epidemiology* 1996; **7**: 14-19 [PMID: 8664395 DOI: 10.1097/00001648-199601000-00004]

5 **Kuczyk MA**, Serth J, Bokemeyer C, Jonassen J, Machtens S, Werner M, Jonas U. Alterations of the p53 tumor suppressor gene in carcinoma in situ of the testis. *Cancer* 1996; **78**: 1958-1966 [PMID: 8909317 DOI: 10.1002/(sici)1097-0142(19961101)78:9<1958::aid-cncr17>3.0.co;2-x]

6 **Frazier AL**, Weldon C, Amatruda J. Fetal and neonatal germ cell tumors. *Semin Fetal Neonatal Med* 2012; **17**: 222-230 [PMID: 22647545 DOI: 10.1016/j.siny.2012.05.004]

7 **Altman RP**, Randolph JG, Lilly JR. Sacrococcygeal teratoma: American Academy of Pediatrics Surgical Section Survey-1973. *J Pediatr Surg* 1974; **9**: 389-398 [PMID: 4843993 DOI: 10.1016/s0022-3468(74)80297-6]

8 **Peterson CM**, Buckley C, Holley S, Menias CO. Teratomas: a multimodality review. *Curr Probl Diagn Radiol* 2012; **41**: 210-219 [PMID: 23009771 DOI: 10.1067/j.cpradiol.2012.02.001]

9 **Hegde P**. Extragonadal omental teratoma: a case report. *J Obstet Gynaecol Res* 2014; **40**: 618-621 [PMID: 24147579 DOI: 10.1111/jog.12198]

10 **Tokunaga M**, Seta M, Yamada M, Nishio M, Yamamoto K, Koyasu Y. Coexistent dermoid cysts of the pouch of the Douglas and ovary resected by laparoscopy. *Asian J Endosc Surg* 2012; **5**: 31-33 [PMID: 22776340 DOI: 10.1111/j.1758-5910.2011.00107.x]

11 **Koo YJ**, Im KS, Jung HJ, Kwon YS. Mature cystic teratoma of the uterosacral ligament successfully treated with laparoendoscopic single-site surgery. *Taiwan J Obstet Gynecol* 2012; **51**: 86-88 [PMID: 22482975 DOI: 10.1016/j.tjog.2012.01.017]

12 **Makni A**, Ben Rhouma S, Farah J, Jouini M, Kacem M, Ben Safta Z. A case of mature teratoma of the Douglas. *Tunis Med* 2013; **91**: 473-474 [PMID: 24008883]

13 **Hackethal A**, Brueggmann D, Bohlmann MK, Franke FE, Tinneberg HR, Münstedt K. Squamous-cell carcinoma in mature cystic teratoma of the ovary: systematic review and analysis of published data. *Lancet Oncol* 2008; **9**: 1173-1180 [PMID: 19038764 DOI: 10.1016/S1470-2045(08)70306-1]

14 **Lu Z**, Chen J. [Introduction of WHO classification of tumours of female reproductive organs, fourth edition]. *Zhonghua Bing Li Xue Za Zhi* 2014; **43**: 649-650 [PMID: 25567588]

15 **Farghaly SA**. Current diagnosis and management of ovarian cysts. *Clin Exp Obstet Gynecol* 2014; **41**: 609-612 [PMID: 25551948]

16 **Asano T**, Kawakami S, Okuno T, Tsujii T, Nemoto T, Kageyama Y, Kihara K. Malignant transformation in a mature testicular teratoma left untreated for more than 50 years since childhood. *Scand J Urol Nephrol* 2003; **37**: 177-178 [PMID: 12745729 DOI: 10.1080/00365590310008947]

17 **Reis F,** Faria AV,Zanardi VA,Menezes JR,Cendes F,Queiroz LS.Neuroimaging in pineal tumors.J Neuroimaging 2006;**16**:52-58.[PMID: 16483277 DOI: 10.1177/1051228405001514]

18 **Sogni P**, Chaussade S, Mosnier H, Abecassis JP, Bonnichon P, Louvel A, Couturier D, Guerre J. [Retrorectal tumor in adults. Combination of computed tomography and endorectal echography]. *Gastroenterol Clin Biol* 1990; **14**: 501-503 [PMID: 2194891]

19 **Yang BL**, Gu YF, Shao WJ, Chen HJ, Sun GD, Jin HY, Zhu X. Retrorectal tumors in adults: magnetic resonance imaging findings. *World J Gastroenterol* 2010; **16**: 5822-5829 [PMID: 21155003 DOI: 10.3748/wjg.v16.i46.5822]

20 **Badmos KB**, Ibrahim OK, Aboyeji AP, Omotayo JA. Squamous cell carcinoma arising in a mature cystic ovarian teratoma with bladder invasion: a case report. *Afr Health Sci* 2011; **11**: 285-287 [PMID: 21857863]

21 **Lee SW**, Southall JC, Gleason NR, Huang EH, Bessler M, Whelan RL. Time course of differences in lymphocyte proliferation rates after laparotomy *vs* CO(2) insufflation. *Surg Endosc* 2000; **14**: 145-148 [PMID: 10656948 DOI: 10.1007/s004649900087]

22 **Chansoon T**, Angkathunyakul N, Aroonroch R, Jirasiritham J. Duodenal mature teratoma causing partial intestinal obstruction: A first case report in an adult. *World J Clin Cases* 2020; **8**: 1489-1494 [PMID: 32368541 DOI: 10.12998/wjcc.v8.i8.1489]

23 **Yoon SS**, Tanabe KK, Warshaw AL. Adult primary retroperitoneal teratoma. *Surgery* 2005; **137**: 663-664 [PMID: 15933637 DOI: 10.1016/j.surg.2004.02.002]

24 **James J**, Dhillon GS, Blewett CJ, Halldorsson A, Cecalupo AJ. A large adrenal teratoma in a neonate. *Am Surg* 2009; **75**: 347-349 [PMID: 19385301 DOI: 10.1097/00006565-199308000-00025]

25 **Murdock J**, Abbas MA. Laparoscopic abdomino-paracoccygeal resection of anorectal cystic teratoma. *JSLS* 2010; **14**: 583-586 [PMID: 21605528 DOI: 10.4293/108680810X12924466008600]

26 **Wang L**, Hirano Y, Ishii T, Kondo H, Hara K, Ishikawa S, Okada T, Obara N, Yamaguchi S. Laparoscopic surgical management of a mature presacral teratoma: a case report. *Surg Case Rep* 2019; **5**: 144 [PMID: 31535236 DOI: 10.1186/s40792-019-0702-x]

27 **Aiken A**, Yu W, Abudoureyimu A, Aizimu X, Tong J. A case of primary rectal teratoma. *Turk J Gastroenterol* 2020; **31**: 835-837 [PMID: 33361050 DOI: 10.5152/tjg.2020.19820]

28 **Nam KH**, Kim B. Primary Mature Teratoma of the Rectum: A Case Report. *Am J Case Rep* 2021; **22**: e930272 [PMID: 33518697 DOI: 10.12659/ AJCR.930272]

68815_Auto_Edited-check.docx

ORIGINALITY REPORT

12%
SIMILARITY INDEX

PRIMARY SOURCES

1	Pingliang Sun, Hailing Ou, Shen Huang, Longxiang Wei, Sen Zhang, Jiali Liu, Shuguang Geng, Kun Yang. "Perianal atypical leiomyoma", Medicine, 2017 Crossref	60 words — 4%
2	surgicalcasereports.springeropen.com Internet	38 words — 2%
3	www.wjgnet.com Internet	31 words — 2%
4	f6publishing.blob.core.windows.net Internet	28 words — 2%
5	Jared Murdock, Maher A. Abbas. "Laparoscopic Abdomino-Paracoccygeal Resection of Anorectal Cystic Teratoma", 'The Society of Laparoendoscopic Surgeons', 2011 Internet	14 words — 1%
6	Tian Fang, Tingting Liang, Yizhuo Wang, Chang Wang. "Synchronous Pancreatic Acinar Cell Adenocarcinoma and Gastric Adenocarcinoma: a Case Report and Literature Review", Research Square, 2021 Crossref Posted Content	13 words — 1%