



## Case Report

# Laparoscopic Excision of Retroperitoneal Mature Teratoma in a Young Male Treated At a Military Hospital: A Case Report

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### Abstract

Teratomas are neoplasms that originate from germ cells and form somatic tissues during various stages of maturation and differentiation. Retroperitoneal teratoma is a rare disease in the adult population, with an incidence of 0.003%. In general, this condition tends to be asymptomatic and is frequently detected incidentally through imaging or during clinical examinations. We report a case of laparoscopic excision of a mature retroperitoneal teratoma in a young male at a military hospital. A 19-year-old soldier presented at the emergency department with recurrent abdominal pain and constipation. After consulting the general surgery team, a mature teratoma was suspected based on the predominance of hypoattenuating fat and the presence of mixed solid and cystic components. The mature teratoma was laparoscopically excised, and the patient was discharged in a satisfactory medical condition on postoperative day 26, without any complications. Surgical excision is strongly recommended when teratomas are detected in adults.

**Keywords:** Retroperitoneal Teratoma; Male Teratoma; Laparoscopic Excision; Military Hospital

### Introduction

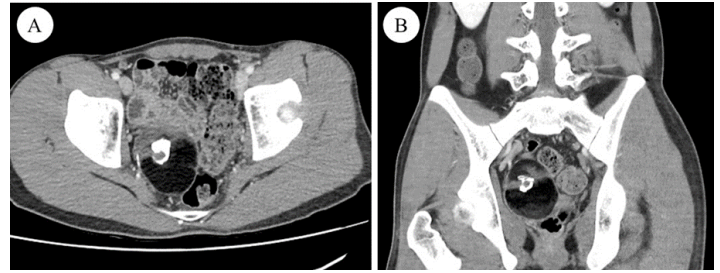
Teratomas are neoplasms that arise from the germ cells of all three primitive embryonic layers (ectoderm, mesoderm, and endoderm) and forms somatic-type tissues at various stages of maturation and differentiation [1]. There are numerous theories about teratomas; nowadays, the Germ Cell Theory is the most widely accepted. According to the Germ Cell Theory, these cells undergo differentiation to give rise to the tissue components of the mesoderm, ectoderm, and endoderm. The migratory potential of germ cells might be responsible for the anatomical variations observed in these tumors and their predilection for development in

the gonads and midline structures [2]. Teratomas typically manifest as nodular and firm masses with variable combinations of cystic and solid components. The cysts may be occupied by keratinous material, clear serous, or mucoid fluid. Additionally, solid regions might contain gray-white nodules, indicative of cartilage, and consist of various types of tissues, including adipose tissue, hair, muscle, and bone [3]. Common locations for Extragonadal teratomas commonly occur in central structures along the midline, such as the intracranial pineal gland, anterior mediastinum, retroperitoneum, and sacrococcygeal regions [4]. Primary retroperitoneal teratomas constitute 1-11% of retroperitoneal neoplasms and predominantly manifest in neonates. As per the literature, there is a bimodal distribution, with a first peak observed during the initial 6 months of life, followed by another peak in early adulthood. Approximately half of the retroperitoneal

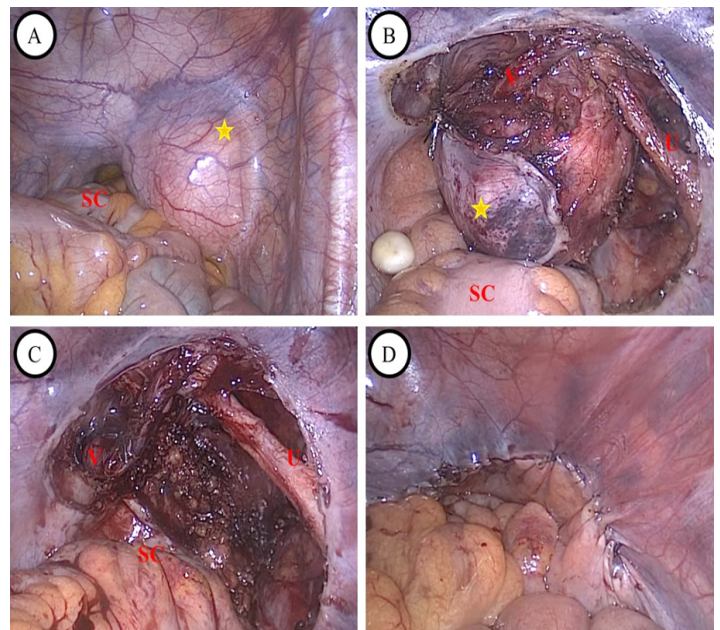
teratomas are identified within the first year of life, with less than 20% detected in patients over 20 years of age [5,6]. In the adult population, retroperitoneal teratoma is a rare case; case reports in the literature describe their unique presentation. The estimated adult incidence is 1 in 40,000-63,000, and 1.4-6.3 patients per year have been described in major hospitals [7]. Here, we report a case of laparoscopic excision of a mature retroperitoneal teratoma in a young male at a military hospital.

### Case Presentation

A 19-year-old soldier presented to the emergency department with recurrent abdominal pain and constipation. The patient had no relevant past medical history and family history. Physical examination results were unremarkable, with no abdominal tenderness or fullness. A digital rectal examination revealed no palpable mass. In addition, laboratory test results were within normal ranges. Abdominopelvic computed tomography (APCT) was performed immediately to determine the cause of abdominal pain. APCT revealed a noninvasive retroperitoneal mass located within the perirectal area. It measured approximately 6.3 × 8.3 cm, and the rectum deviated to the left side owing to the presence of a large mass (Figure 1A and 1B). After consulting the general surgery team, a mature teratoma was suspected based on the predominance of hypoattenuating fat and the presence of mixed solid and cystic components. Laparoscopic mass excision was planned, and the mass was observed on the right side of the sigmoid colon (Figure 2A). The anterior peritoneal reflection was dissected to encounter a large mass, which was circumferentially dissected from the surrounding tissue and completely removed (Figure 2B). After the removal of the mass, we confirmed preservation of the vas deferens and ureters (Figure 2C). Peritoneum was closed with barbed suture material using the laparoscopic technique (Figure 2D), and a closed suction drain was inserted into the excision area. No other intra-abdominal organ abnormalities were observed. Grossly, the specimen displayed an outer surface that appeared coarse and irregular surface (Figure 3A). The intracystic components were sebaceous and mucinous fluids along with multiple hair shafts (Figure 3B). Under microscopic examination, the lesion was identified as a cystic structure lined with keratinized stratified squamous epithelium and skin appendages, including hair shafts (Fig. 4A and 4C). Cortical bone, bone marrow tissue, and cartilaginous tissue (Figure 4B and 4D) also showed no indications of malignancy or immature components. All laboratory findings normalized on postoperative day (POD) 5, and the APCT showed no complications on POD 7. The patient was discharged in good medical condition on POD 26, without any complications.

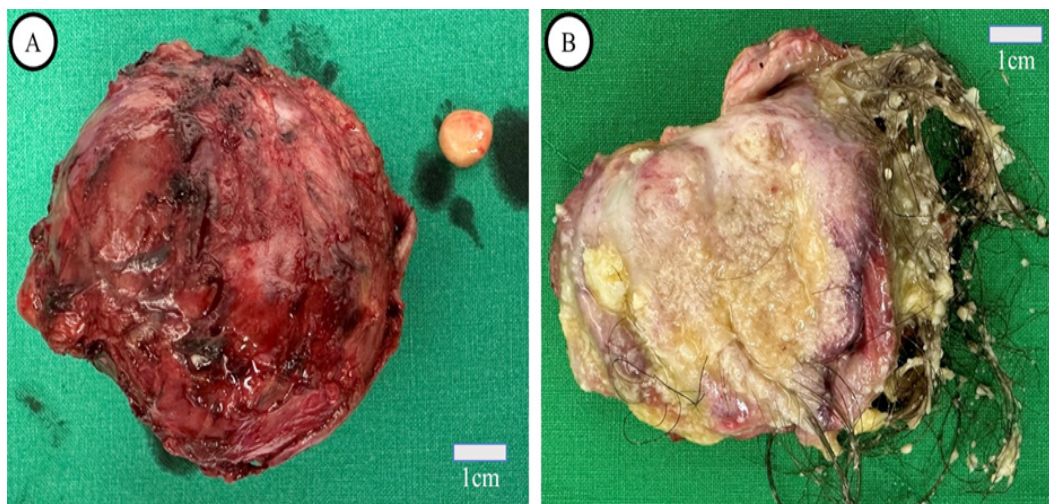


**Figure 1:** APCT finding of retroperitoneal mature teratoma. A. Axial view of the retroperitoneal teratoma located within the perirectum area without invasion, approximately 6.3x8.3cm mass. B. Coronal view shows left-sided deviation of the rectum due to teratoma.

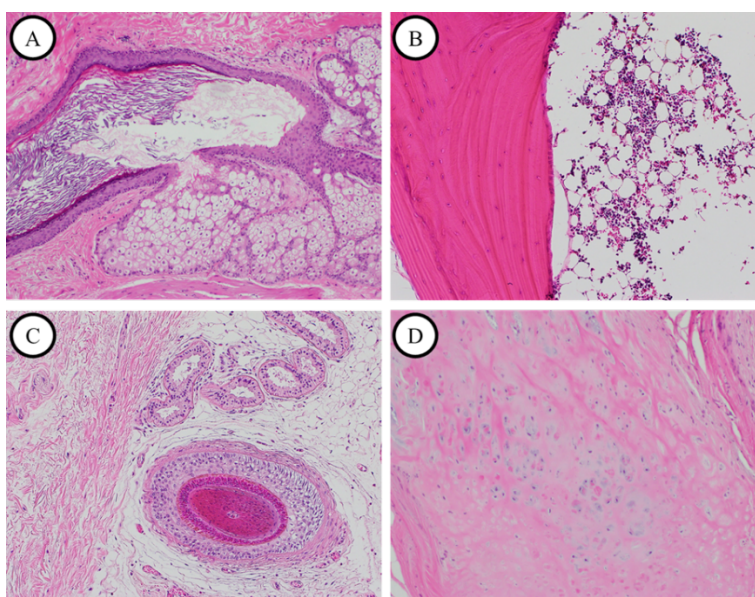


**Figure 2:** Laparoscopic operation finding of retroperitoneal mature teratoma. Yellow Star; Teratoma, SC; Sigmoid colon, V; Vas, U; Ureter. A. A teratoma is present on the right side of the sigmoid colon. B. Peritoneum opened, careful dissection for teratoma excision. C. After teratoma excision, both vas and ureter were preserved. D. Peritoneum was closed using barbed suture material by laparoscopic technique.





**Figure 3:** Gross finding of retroperitoneal mature teratoma. A. Outer surface. B. Sebaceous contents and hair.



**Figure 4:** Microscopic examination of retroperitoneal mature teratoma. A. Skin and appendageal tissues. B. Cortical bone and bone marrow. C. Skin appendage and hair follicle. D. Cartilaginous tissue.

### Discussion

Our case is unique because it involved a young male soldier who underwent laparoscopic surgery at a military hospital. A literature review revealed unique case reports or small single-institutional case series [8]. Retroperitoneal teratomas have an incidence of 0.003% at birth and predominantly occur in women. Additionally, half of the retroperitoneal teratomas are identified within the first year of life, with less than 20% detected in patients over 20 years of age [5]. Therefore, this condition is considered rare in the adult population, including our case. Teratomas are usually asymptomatic and frequently detected incidentally through imaging or during clinical examination. In adult patients, the usual presentation involves nonspecific symptoms or symptoms arising from mass effects such as back or abdominal pain, gastrointestinal symptoms (such as nausea, vomiting, and constipation), genitourinary symptoms, and edematous change of lower extremity or genital area due to lymphatic obstruction [9]. During a physical examination, retroperitoneal teratomas can be identified through a palpable abdominal mass along with tenderness, and progressive abdominal distension [6].

Our patient presented with symptoms related to a mass in the rectum, which resulted in constipation and lower abdominal pain after defecation. APCT is the most recommended diagnostic radiological examination. The hallmark of APCT in diagnosing retroperitoneal teratomas is the identification of a complex mass with a well-circumscribed fluid volume, fat fluid level comprising adipose tissue or sebaceous material, and calcifications [10]. While APCT was previously the standard diagnostic tool for teratomas, magnetic resonance imaging (MRI) has recently been used to diagnose teratomas. MRI provides enhanced soft tissue resolution and is particularly valuable in assessing the encasement or invasion of blood vessels, aiding in determining the malignant potential and the possibility of surgical resection. [11]. In some cases, retroperitoneal teratomas have been reported to exhibit elevated levels of alpha-fetoprotein, carcinoembryonic antigen, and carbohydrate antigen 19-9. Elevated alpha-fetoprotein levels were observed in 100% of malignant teratomas, 50% of immature teratomas, and 6% of mature benign teratomas [12]. However, it is essential to acknowledge that elevated levels of carcinoembryonic antigen and carbohydrate antigen 19-9 can also be observed in several malignancies, and their clinical utility has not been consistently demonstrated [4]. The malignancy rate of 25.8% in adults is significantly higher than the documented rate of 6.8% in children [13]. Therefore, a complete surgical excision is strongly recommended when a teratoma is detected in the adult population. In addition, a definitive diagnosis can only be achieved through the histological evaluation of the specimen, making surgical resection essential for both diagnosis and treatment. The choice of surgery can involve either an open or laparoscopic approach, depending on the surgeon's preference and experience. Although laparoscopic excision of retroperitoneal teratomas was first reported in 1995, subsequent reports on the laparoscopic approach are rare [14]. The laparoscopic approach has several advantages, including rapid recovery, minimal morbidity, and a shorter operating time. Therefore, our experienced surgical team chose the laparoscopic approach to achieve successful complete excision.

## Conclusion

Retroperitoneal teratomas are rare neoplasms that are incidentally diagnosed in adults. They have specific APCT findings, such as a complex mass with a well-circumscribed fluid volume, fat fluid level, and calcifications. Most teratomas are benign; however, their potential for malignancy gradually increases with age. Therefore, complete surgical excision is strongly recommended when a teratoma is detected. Furthermore, the laparoscopic approach is feasible and safe for teratoma excision when performed by experienced surgeons.

**Ethical Statement:** Written informed consent was obtained from the patient prior to publication. The study was approved by the Institutional Review Board of the Armed Forces Capital Hospital (No. AFCH IRB 2023-06-001). The Institutional Review Board waived the requirement for written informed consent.

**Conflicts of interest:** The authors have no conflicts of interest to declare.

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