Jemis, 3 2015

Primary laparoscopic excision of benign mature retroperitoneal teratoma

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ABSTRACT

Introduction: Retroperitoneum is the third most common extragonadal site for occurrence of teratoma in children, after sacrococcygeal region and gonadal sites. Although many authors have previously reported laparoscopic removal of benign retroperitoneal teratoma in adults, the experience in pediatric setting is extremely limited.

Material and methods: We report our experience with laparoscopic excision of a mature cystic retroperitoneal teratoma occurred in a 13-year old girl, focusing on operative technical details.

Results: Primary laparoscopic excision of the retroperitoneal was achieved without intraoperative complication. Histological examination of the mass revealed a benign mature teratoma. At 3-month follow-up the patient is doing well and present no recurrence of disease; cosmetic result is excellent.

Discussion and conclusion: Knowledge of retroperitoneal anatomy, accurate preoperative assessment and adequate training and skills makes the laparoscopic resection of a benign retroperitoneal tumor a safe and feasible procedure also in a pediatric setting.

1. INTRODUCTION

Retroperitoneal germ cell tumors account for approximately 2-5% of germ cell tumors in children (1-2). These rare tumors arise from the totipotent primitive germ cell and are histologically classified as mature, immature, or frankly malignant, with most pediatric teratomas classified as mature. Although mature and immature teratomas usually demonstrate a benign clinical behavior, malignancy is reported to occur in approximately 15% of cases (2). Primary resection should be attempted if preoperative imaging suggests lack of contiguous organ involvement or metastatic disease (2). Due to the enormous size and close relations with intrabdominal organs and structures, laparotomic excision of the mass has been reported as the mainstay of treatment (1-3). In this report , we provide our experience with primary

laparoscopic excision of a mature mixed (cystic and solid) retroperitoneal teratoma occurred in a 13-year old girl, focusing on operative technical details.

2. CASE PRESENTATION

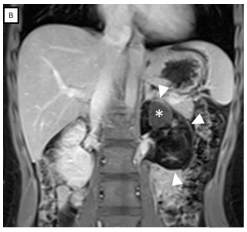

Figure 1: A. Cross sectional imaging of contrast-enhanced CT scan that demonstrates the presence of a heterogeneous retroperitoneal macroscopic lesion with polymorphic coarse calcification (arrows) (*: abdominal aorta, arrowheads: pancreatic tail, • left kidney). B: MR coronal image of T1w fat-sat acquisition in a post-contrastographic phase that demonstrates well defined lesion with thin pseudocapsule (arrowheads), fatty content and internal cystic space (*).

An otherwise asymptomatic 13-year-old girl was referred to our hospital because of abdominal mass incidentally discovered at an X-ray performed for asymmetry of hips. The X-ray showed a calcified abdominal mass to the left of antero-lateral side of the second lumbar vertebra. CT scan showed a clearly bordered solid mass with adipose and calcified tissues, containing numerous cysts, localized posteriorly to the tail of the pancreas and in front of the left kidney, suggestive for teratoma. MRI scan confirmed the diagnosis of a retroperitoneal teratoma extending above the left adrenal gland, between the pancreatic tail and the left kidney, medially to the to the descending colon and left colic flexure, measuring 62x40x78 mm with radiological features of a benign lesion (fat content with low T1 signal, very low enhancement, no signs of invasion) (Figure 1). Patient physical examination, complete blood count, routine blood chemistry was unremarkable. Serum levels of tumor markers were: AFP (alpha-fetoprotein) 1.1 ng/ml, beta-HCG 0.0 ng/ml, CA 19-9 (carbohydrate antigen) 7.1 U/ml, CEA 0.8 ng/ml (carcinoembryonic antigen), CA 125 (carcinoma antigen) 20.6 U/ml, NSE (neuron-specific enolase) 13 ng/ml. The patient underwent complete tumor removal through laparoscopy approach. Tumor histological examination revealed a mature cystic teratoma. The post-operative course was uneventful. At 3-month follow-up she is doing well with no tumor recurrence at imaging follow-up. The cosmetic result is excellent.

Surgical technique

The patient was placed supine with legs extended on abducted leg support and in Trendelenburg position. The surgeon stood between the legs of the patient, the assistant to the right of the surgeon and the scrub nurse to the left. The first 10-mm Hasson trocar was inserted in umbilicus with an open technique and pneumoperitoneum was achieved. A 30° 5-mm telescope was used. Two 5-mm trocars were placed in the left and right pararectal line half-way between umbilicus and the antero-superior iliac spine. A fourth 5-mm port was positioned just below the left costal arch in the emiclavear line. The transverse colon was grasped and moved up to better expose the mass, confirming its retroperitoneal origin (Figure 2A).

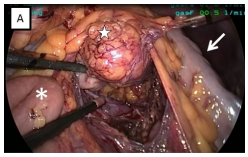

Figure 2: Intraoperative picture showing A: The transverse colon (arrow) was grasped and moved up to better expose the retroperitoneal mass (white star), which was huge, polilobate and containing numerous cysts. B: Aspiration of the largest cyst of the mass before its complete removal. C: Dissection of the mass from the left renal vein (arrowheads).

After having incised the left transverse mesocolon, on the left of left colic artery and the Gerota's fascia, we have begun the tumor dissection from the surrounding tissues and organs, starting from the larger cysts. Five-mm Ligasure™ Maryland Jaw (Covidien, Dublin, Ireland) was used to seal the tumor vascular afferents, mostly coming from the left renal artery and vein, to which ones the mass was strictly tight. To increase the working space, the 2 larger cysts were aspirated before approaching the renal vessels (Figure 2B) and to facilitate their dissection. To assist in the dissection of the renal vessels (Figure 2C) and to ensure a better vascular control in case of their tear, a fifth 5-mm trocar was inserted in right hypochondrium. After the renal pedicle was dissected, we completed tumor isolation from the anterior surface of the left kidney and adrenal gland. Eventually, after having separated the tumor from the stomach and transverse colon, it was put into an endobag and removed through a short Pfannenstiel incision. A drainage was left in the left renal lodge.

3. DISCUSSION

Retroperitoneum is the third most common extragonadal site for occurrence of teratoma, after sacrococcygeal region and gonadal sites (1-2). Approximately 15% of retroperitoneal teratomas have been found to be malignant, based on the presence of features of embryonal carcinoma, corioncarcinoma or yolk salk tumor at histological examination (2-3). Infants generally present with a palpable abdominal mass, while abdominal distension, unspecified gastrointestinal symptoms or incidentaloma, as in our case, is more common in older patients (4). CT scan or MRI of the abdomen are necessary in order to differentiate teratomas from the more commonly occurring neuroblastoma or Wilms' tumor. Complete excision without evidence of intraoperative rupture represents the definitive therapy for benign tumors and is associated with an excellent long-term prognosis (1-3). Postoperative chemotherapy is indicated only for unresectable lesions, immature teratomas and malignant germ cell lesions to prevent relapses (2). Histology, female gender and incomplete resection are the main risk factors for long term patient survival and a close follow-up is mandatory also for incompletely resected benign teratoma, because of the possible malignant transformation of residual (3-6%) (1-3). Due to their usually enormous size and close relationship with intrabdominal organ structures, open surgical removal of the tumor has been reported as the mainstay of treatment (1-3). Although surgical excision can be difficult, especially in case of huge teratoma (2), fortunately, it is almost always possible for the surgeon to identify a well-defined cleavage plane between the tumor and the retroperitoneal organs, that are usually only compressed and/or displaced (1-3). The absence of apparent connections and the presence of a plane of areolar tissue between the teratoma and retroperitoneal organs allows a radical, but sparing surgery in most of the cases and makes this step of the procedure easy. The most critical point

of the operation, and this was true also in our case, is the dissection of the tumor from the renal vessels and, in case of huge retroperitoneal teratoma, from the inferior vena cava and the superior mesenteric vessels: a severe bleeding can be difficult to manage laparoscopically and one more trocar can prevent this challenging complications. So, the laparoscopic approach can be applied and suggested to those tumors displaying benign findings at radiological assessment, such as fat content with low T1 signal, very low enhancement, no evidence of vascular invasion, well-circumscribed tumor with separate planes between the mass and the surrounding tissues (4-5). A careful preoperative imaging assessment is thereby mandatory in order to exclude signs of malignancy, that represent a contraindication for the mininvasive technique (2,4). Although many authors have previously reported laparoscopic removal of benign retroperitoneal tumor in adults (4-5), the experience in pediatric setting is extremely limited. Deep knowledge of retroperitoneal anatomy, accurate preoperative assessment and adequate training and skills makes the laparoscopic resection of a benign retroperitoneal tumor a safe and feasible procedure also in pediatric setting. Eventually, in female teenagers, the greatly improved cosmetic results offered by the laparoscopic technique have an important psychological impact on patient's self-esteem.

REFERENCES

1) Mahour GH, Landing BH, Woolley MM: Teratomas in children: Clinico-pathologic studies in 133 patients. Z Kinderchir 23:365–380, 1978.

2) Gatcombe HG, Assikis V, Kooby D, et al : Primary retroperitoneal teratomas: A review of the literature. J Surg Oncol 86 :107–113, 2004.

3) Luo CC, Huang CS, Chu SM, Chao HC, Yang CP, Hsueh C. Retroperitoneal teratomas in infancy and childhood. Pediatr Surg Int 21(7):536-40, 2005.

4) Jones NM, Kiely EM. Retroperitoneal teratomas-potential for surgical misadventure. J Pediatr Surg 43(1):184-6, 2008.

5) Cadeddu MO, Mamazza J, Schlachta CM, Seshadri PA, Poulin EC. Laparoscopic excision of retroperitoneal tumors: technique and review of the laparoscopic experience. Surg Laparosc Endosc Percutan Tech 11(2):144-7, 2001.