Case Report

Pelvic Castleman's Disease Presenting as an Adnexal Mass in an Adolescent

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A B S T R A C T

Background: Castleman disease (CD) is a rare lymphoproliferative disorder that might present as an adnexal mass. We report a case of pelvic CD in an adolescent girl who presented with abdominal pain.
Case: A 13-year-old girl presented with severe abdominal pain, nausea, and vomiting, and was found to have a solid adnexal mass. Repeat imaging revealed the mass to be retroperitoneal and in the left pelvic side wall. She underwent surgical removal via an open retroperitoneal approach, and pathology revealed CD, hyaline vascular variant subtype.
Summary and Conclusion: Pelvic CD should be considered in the differential diagnosis for an adnexal mass in a young woman. Surgical planning is critical because of the possibility of extension and mass effect. Most pelvic CD is unicentric, hyaline vascular variant subtype, and does not recur after surgical removal.
Key Words: Castleman disease, Adnexal mass

Introduction

Castleman disease (CD) is a rare, benign lymphoproliferative disorder originally described by Castleman and Towne in 1954.[1] Although one type of CD might be associated with infection with human herpesvirus 8, most types are of unknown etiology. CD masses have been found in lymphatic tissues of the chest, neck, abdomen, and pelvis.[2] A few cases have been reported of pelvic CD in young adults, often presenting as an adnexal mass, but no cases of pelvic CD have been reported in pediatric patients. We describe a case of pelvic CD in an adolescent who presented with lower abdominal pain with initial imaging suggesting a solid adnexal mass.

Case

A 13-year-old girl with menarche at age 12 was referred to our pediatric and adolescent gynecology division for evaluation of a pelvic mass that was detected using transabdominal ultrasound and abdominal computed tomography scan. Four days previously, she had experienced severe bilateral lower abdominal pain upon inserting a tampon for the first time. The patient immediately removed the tampon, but her pain persisted and she became nauseated. She was referred from a local urgent care facility to an outside emergency department to rule out appendicitis. Transabdominal pelvic ultrasound revealed a 4.1 cm × 2.9 cm × 3.5 cm left adnexal mass with blood flow, which was seen on computed tomography scan as a homogenously hyperenhancing circumscribed mass in the left ovary. Her pain was attributed to menstrual cramping and she was sent home. At home, she continued to experience severe abdominal pain, nausea, and anorexia. She visited a local pediatrician 2 days later, where a second ultrasound similarly revealed a solid left ovarian mass 4.9 cm × 4.8 cm × 3.7 cm in size.

The patient was referred to us by her pediatrician, and the next day in our office, her physical examination was notable for moderate tenderness to palpation in the lower quadrants without rebound or guarding. A single digit bimanual examination was performed due to concern for possible torsion, and the mass was not palpable on this exam. On the basis of the outside imaging studies (computed tomography scan and 2 ultrasound examinations) that were reviewed with our radiologists, the differential diagnosis included ovarian tumor, endometrioma, hemorrhagic ovarian cyst, and intermittent ovarian torsion. Because of concern for ovarian tumor, blood was drawn to measure levels of tumor markers including β-human chorionic gonadotropin, alpha-fetoprotein, lactate dehydrogenase, carcinoma antigen 125, and total inhibin. All tumor markers returned within the normal range.

Later that evening, the patient's abdominal pain worsened considerably so she returned to the emergency department of our pediatric hospital. She was admitted to the Gynecology Service because of concern for ovarian torsion and for pain management. The patient was kept with nothing taken orally and scheduled for a diagnostic laparoscopy. However, that evening, the operating room was not available for several hours because of an emergent liver transplantation, so the patient was reimaged at our institution. This third ultrasound examination revealed a hypervascular solid-appearing soft tissue mass inferior and dorsal to a normal-appearing left ovary, measuring 4.0 cm × 3.3 cm × 2.7 cm (Fig. 1). The

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management plan then changed, because it was apparent that the ovary was not involved and the mass was retroperitoneal. Abdominal and pelvic magnetic resonance imaging revealed a diffusion-restricting, arterially enhancing solid mass in the left pelvic side wall retroperitoneum (Fig. 2). Differential diagnosis now included sarcoma, CD, metastatic melanoma, lymphoma, and inflammatory myofibroblastic tumor. The decision was made to defer surgical intervention because the mass was retroperitoneal and not contiguous with the ovary, but instead to pursue ultrasound-guided biopsy of the mass for tissue sampling. The biopsy was performed on the day of hospital admission, and 2 days later the pathology resulted with microscopic examination of needle core biopsies notable for lymphoid tissue with a few distinct follicles, some with expanded mantle zones, arranged in concentric rings. Flow cytometric analysis of the biopsies revealed no monoclonal B-cell or abnormal T-cell populations. On staining, the tissue was negative for human herpesvirus 8. The microscopic finding of follicular lymphoid hyperplasia led to a diagnosis of CD, hyaline vascular variant (HVV) subtype. The patient was discharged home with pain medications and a plan to return for scheduled surgery the following week.

Five days later, the patient was readmitted for surgical removal of the mass via an open retroperitoneal approach. The pediatric general surgery team performed the patient's surgery, with assistance from a pediatric urologist, who performed cystoscopy and placed a ureteral stent because of the proximity of the ureter to the mass. The mass was noted to be hypervascular, friable, and inflamed. It was densely adherent and required dissection off the lateral pelvic side wall and the femoral nerve. The removed specimen was identified as multiple matted lymph nodes measuring 5.5 cm × 3.5 cm × 2 cm in total. Microscopic examination revealed marked follicular hyperplasia (Fig. 3A) with concentric layering of mantle-zone lymphocytes. Most follicles were hyalinized and atrophic with an expanded follicular dendritic cell network (Fig. 3B, and C). Additionally, vascular proliferation was prominent throughout the tissue, with vessels coursing through many

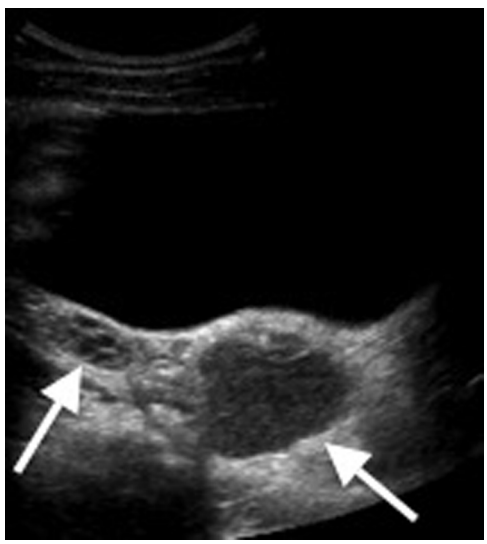

Fig. 1. Third transabdominal ultrasonography revealed a solid mass (right arrow) distinct from and adjacent to the left ovary (left arrow).

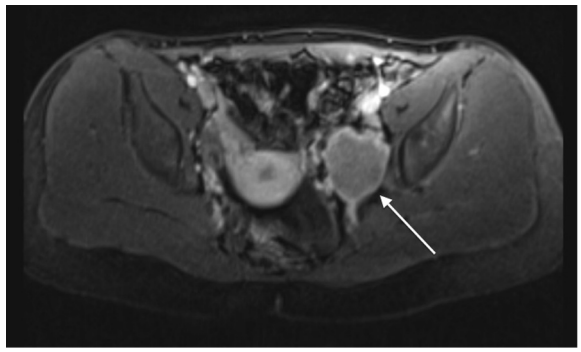

Fig. 2. Magnetic resonance image shows an arterially enhancing retroperitoneal solid mass in the left pelvic sidewall (arrow).

of the atrophic germinal centers (Fig. 3D). In situ hybridization for Epstein-Barr virus was negative. Further immunohistochemical and flow cytometric analyses were consistent with a benign process, confirming the diagnosis of HVV CD (Fig. 3). The patient recovered well and was discharged 3 days after the surgery. The patient was seen for follow-up in the pediatric hematology and oncology division approximately 4 months postoperatively, and at that time had recovered well, other than some mild incisional pain, which was attributed to scar tissue. It was recommended that she have lymph node examination by her primary pediatrician in 6 months and then annually to monitor for recurrence. It has been 2 years after this young woman's surgery and her family reports she continues to do well with no signs of recurrence.

Summary and Conclusion

CD includes unicentric and multicentric forms, which are thought to represent distinct clinical entities with different risk factors, presentations, treatment response, and long-term survival.[3] The most common form, unicentric, is most often found in adults of both sexes ages 20-30 years and presents asymptomatically or because of compressive symptoms related to the mass.[4] Unicentric CD affects a single group of lymph nodes, most often in the chest or abdomen, and is generally cured using surgical resection of the involved group of lymph nodes.[3] Multicentric CD is more often found in adults ages 50-60 years and is likely to present with systemic symptoms, including fever, malaise, night sweats, weakness, weight loss, and peripheral lymphadenopathy.[4] Multicentric CD might also be seen in immunosuppressed patients who are infected with HIV and human herpesvirus 8.[5] Multicentric CD tends to behave aggressively, like a lymphoma, and is less likely to be cured by surgical resection.[3] CD can also be grouped into histopathological subsets, including HVV, plasmacytic, and mixed cellular variety. Unicentric disease tends to be of the HVV subtype, but centricity is more significant than histopathologic type in long-term disease outcome.[3]

Multiple case reports have described pelvic CD in young adults ages 22-30 years. For example, Lee et al described a 27-year-old woman with pelvic CD that presented as an asymptomatic pelvic mass.[6] Transvaginal ultrasonography demonstrated a 7 cm × 5 cm hyperechoic mass adjacent to

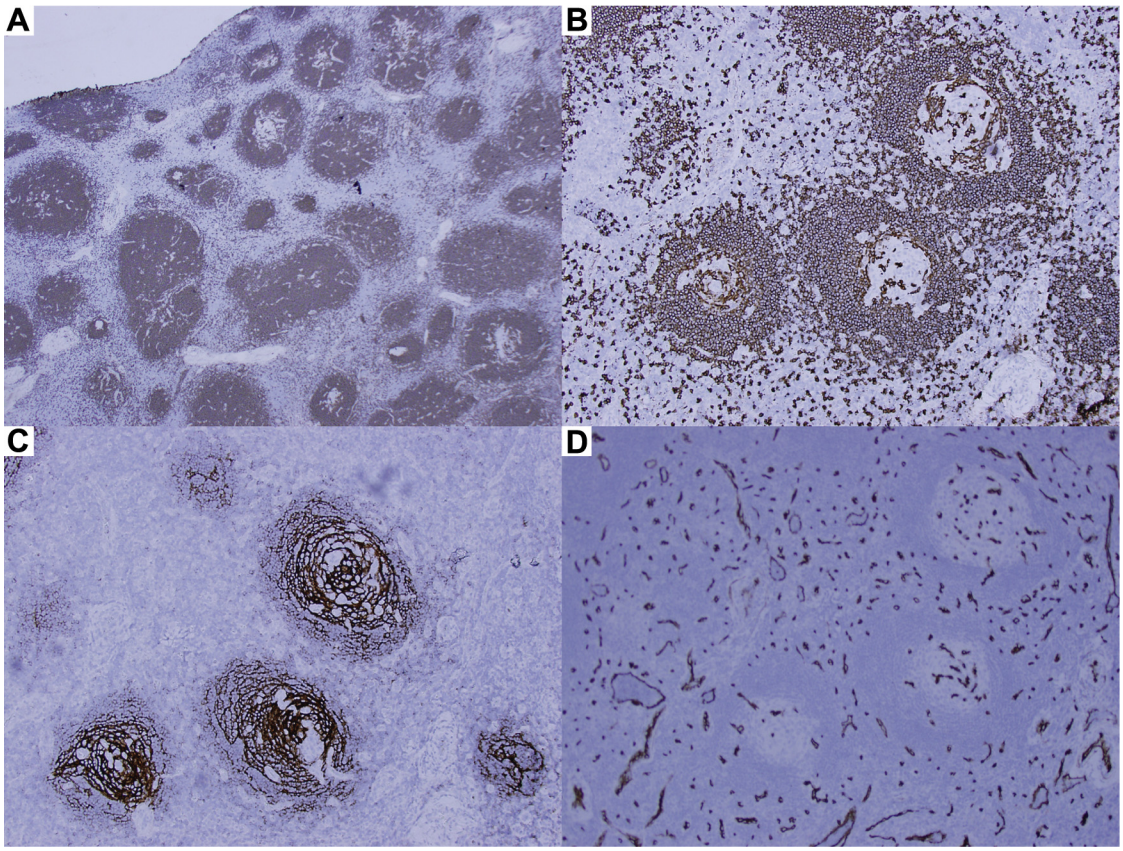

Fig. 3. Histopathology of excised lymph nodes. (A) Immunohistochemical staining for CD20 showing expanded follicular architecture with atrophic centers (×40). (*B-D*) Immunohistochemical staining of adjacent sections of tissue showing the same 3 follicles at magnification ×100: (B) CD20 staining highlights follicular B cells surrounding the atrophic germinal center; (C) CD21 staining shows the expanded follicular dendritic cell network within the remnant germinal centers; (D) CD34 highlights vascular proliferation. Photographs by Adam Bailey MD, Department of Pathology, Washington University School of Medicine.

the ovary. Abdominal computed tomography showed this mass in the right extraperitoneal pelvis, and it was thought to be a benign neoplasm of either the lymph node or right ovary. The mass was removed via single-port access laparoscopy, and it was noted to closely approximate the external iliac vessels without vascular invasion. Histologic examination revealed it to be HVV CD.

Nakamura et al reported pelvic CD in a 30-year-old woman who was suffering from infertility.[7] A hyperechoic mass measuring 4 cm × 5 cm was noted adjacent to the right ovary on transvaginal ultrasonography. The patient was asymptomatic with normal laboratory studies. The pelvic mass was removed via laparotomy and noted to be retroperitoneal between the internal and external iliac arteries. Histological examination revealed increased lymphoid follicles with concentric hyperplasia of mantle zones in an onion-skin pattern, consistent with HVV CD. Follow-up ultrasonography at 7 years after surgery showed no evidence of recurrence.

In our case, the patient presented with lower abdominal pain, which incidentally occurred in the setting of tampon use with menses. This history was important to the patient as a presenting complaint, but ultimately diverted attention from the true etiology of her symptoms. The mass was detected during imaging studies intended to rule out appendicitis, and was initially suspected to be an ovarian tumor. Further imaging at our institution later determined that the mass did not originate in the adnexa, but in the retroperitoneum. A laparoscopic approach would have been inappropriate for this patient; instead an open retroperitoneal approach was chosen. Additionally, surgical planning was critical for our patient, who required a joint surgery by pediatric general surgery and pediatric urology. Surgical removal was challenging because of the mass's adherence to the femoral nerve and proximity to the ureter. Other authors have similarly noted the difficulty of surgical removal because of hypervascularity of the mass and dense fibrous adhesion to pelvic vessels and sidewall.[8] If CD were to be mistaken for an adnexal mass or tumor, gynecologists might choose laparoscopic surgery and could encounter a retroperitoneal mass adherent to iliac vessels or pelvic nerves necessitating conversion to laparotomy and/or emergent assistance from general or vascular surgery.

In conclusion, pelvic CD is a rare clinical entity that is important to recognize to prevent further extension and mass effect, as well as to promote adequate surgical planning. As our case and others show, pelvic CD often presents as a pelvic mass concerning for an adnexal tumor. Patients are typically asymptomatic and without laboratory abnormalities. Imaging with either computed tomography scan or pelvic magnetic resonance imaging with contrast could be useful for diagnosis of this pathology and to assist with preparation for surgical resection. In our case, magnetic resonance imaging lead us to the conclusion that this mass was retroperitoneal and not ovarian in origin, and

computed tomography-guided biopsy allowed for rapid tissue diagnosis. CD is an important consideration in the differential diagnosis of a pelvic mass in a young woman. Most pelvic CD is unicentric, HVV subtype, and does not recur after surgical removal.[2]

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