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INCIDENTAL STRUMA OVARII PRESENTING AS A MULTILOCULATED "STAINED-GLASS" ADNEXAL MASS ON MAGNETIC RESONANCE IMAGING: A CASE REPORT

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ABSTRACT

Struma ovarii is a rare monodermal ovarian teratoma composed predominantly of thyroid tissue and represents an uncommon cause of a complex adnexal mass. Preoperative diagnosis is challenging because imaging findings may overlap with those of other benign and malignant ovarian neoplasms. We report the case of an 84-year-old woman who underwent lumbar spine magnetic resonance imaging for chronic low back pain, which incidentally demonstrated a left adnexal mass at the inferior edge of the field of view. Dedicated pelvic magnetic resonance imaging showed a well-circumscribed multiloculated left adnexal mass with heterogeneous locular signal intensities on T2-weighted images, producing a "stained-glass" appearance, together with avidly enhancing solid components and no diffusion restriction. The preoperative imaging suggested struma ovarii, without completely eliminating the diagnosis of a mucinous carcinoma. Laparoscopic resection was performed, and histopathological examination demonstrated a monodermal teratoma composed exclusively of mature thyroid tissue without evidence of malignancy. This case highlights the value of recognizing characteristic imaging features of struma ovarii and the importance of reviewing extraspinal structures included on lumbar spine magnetic resonance imaging.

KEYWORDS

Struma Ovarii, Adnexal Mass, Monodermal Ovarian Teratoma, Thyroid Tissue, Stained-glass Appearance

MAIN ARTICLE

INTRODUCTION

Struma ovarii is a rare monodermal ovarian teratoma defined by the presence of thyroid tissue comprising more than 50% of the tumor. It accounts for approximately 1% of ovarian tumors and 2–5% of ovarian teratomas [1,2]. Most lesions are benign and clinically asymptomatic, and preoperative diagnosis remains challenging because imaging findings may overlap with those of epithelial ovarian neoplasms and other complex adnexal masses [2-4]. Nevertheless, certain magnetic resonance imaging features, particularly a multiloculated cystic mass with variable locular signal intensities and avidly enhancing solid components, may suggest the diagnosis [2,5].

CASE PRESENTATION

An 84-year-old woman with no significant past medical history was referred for lumbar spine magnetic resonance imaging for evaluation of chronic low back pain. At the inferior aspect of the field of view, an incidental left pelvic mass was identified. Dedicated pelvic magnetic resonance imaging was subsequently performed for further characterization.

Pelvic magnetic resonance imaging demonstrated a well-circumscribed multiloculated left adnexal mass measuring 56 × 47 × 55 mm (transverse × anteroposterior × craniocaudal). The left ovary could not be identified separately from the lesion, supporting an ovarian origin.

The mass showed predominantly low to intermediate signal intensity on T1-weighted images and heterogeneous signal intensity on T2-weighted images, with multiple locules ranging from low to high signal intensity, producing a “stained-glass” appearance (Figure 1). Solid components demonstrated intermediate T2 signal intensity, high signal intensity on diffusion-weighted imaging, and no true restricted diffusion on the apparent diffusion coefficient map, with overall high apparent diffusion coefficient values (Figure 2). After intravenous gadolinium administration, the solid components enhanced avidly (Figure 3).

No invasion of adjacent pelvic structures was identified. The uterus was unremarkable. The right ovary was not visualized. The urinary bladder and rectum were normal. There was no free fluid in the pouch of Douglas, no pelvic lymphadenopathy, and no peritoneal disease. On the basis of these findings, a preoperative diagnosis of struma ovarii was suggested.

The patient underwent laparoscopic resection of the left adnexal mass. Gross examination revealed an encapsulated mass with a fleshy consistency and focal areas of hemorrhage. Histopathological examination demonstrated a monodermal ovarian teratoma composed

exclusively of mature thyroid tissue with variably sized follicles filled with colloid and lined by bland follicular epithelium without significant cytologic atypia. The interstitial stroma showed focal fibrosis with scattered mononuclear inflammatory cells. The fallopian tube was intact. No malignant features were identified. The final diagnosis was benign struma ovarii.

DISCUSSION

Struma ovarii is the most common monodermal ovarian teratoma, but it remains rare in routine practice. Clinical presentation is usually nonspecific, and many lesions are discovered incidentally. Although most cases occur in women of reproductive or perimenopausal age, struma ovarii can also present in patients of any age, including elderly patients, as in the present case [1,2,4].

The principal strength of this case is its imaging pattern. Classic magnetic resonance imaging descriptions of struma ovarii include a unilateral multiloculated complex adnexal mass with thick septa or solid components, variable signal intensity among locules, and avid enhancement of solid thyroid tissue. Low-signal locules on T2-weighted images are thought to reflect viscous gelatinous colloid, while enhancing septa and solid areas correspond to thyroid tissue and fibrous stroma. A “lacy” post-contrast appearance has also been described when multiple small cysts are embedded within enhancing tissue [2,5-8].

In the present case, the heterogeneous T2-weighted locular signals created a “stained-glass” appearance that strongly suggested struma ovarii. However, this sign is not pathognomonic, because multilocular mucinous ovarian neoplasms may show a similar appearance. The diagnosis in this patient was favored by the coexistence of avidly enhancing solid components, absence of macroscopic fat or calcified Rokitansky nodule, lack of papillary projections, and absence of invasive or metastatic features. In addition, the high signal intensity on diffusion-weighted imaging, without corresponding low apparent diffusion coefficient values, was consistent with T2 shine-through rather than true diffusion restriction [2,3,5-7].

The main imaging differential diagnoses include mucinous cystic ovarian neoplasm, mature cystic teratoma, and cystadenofibroma. Mucinous ovarian neoplasms may also present as multilocular cystic masses with variable locular signal intensities. However, the combination of low-T2 locules, thick enhancing septa, and avidly enhancing solid components may favor struma ovarii, although substantial imaging overlap remains. Mature cystic teratomas usually contain macroscopic fat, fat-fluid levels, or calcifications, none of which were present in this

case. Cystadenofibromas more often contain markedly low-T2 fibrous solid components with progressive rather than avid enhancement [2,3,5-7].

This case also underscores the importance of carefully reviewing extraspinal structures included within the field of view on lumbar spine magnetic resonance imaging. Incidental pelvic abnormalities may represent the first clue to clinically important disease and should not be overlooked. In this patient, recognition of the adnexal lesion on lumbar imaging prompted dedicated pelvic evaluation and a confident preoperative differential diagnosis. Definitive diagnosis of struma ovarii remains histopathological. Most lesions are benign, while malignant transformation is rare. Accurate preoperative recognition may help guide appropriate surgical planning and avoid unnecessarily extensive surgery for what is typically a benign ovarian neoplasm [1,2,4].

CONCLUSION

Struma ovarii should be considered in the differential diagnosis of a multiloculated adnexal mass with heterogeneous signal intensities among the locules, avidly enhancing solid components, and no aggressive features. Recognition of the suggestive “stained-glass” appearance, particularly in the absence of aggressive or invasive features and metastatic disease, may allow a more confident preoperative diagnosis, even when the lesion is discovered incidentally on imaging performed for an unrelated indication.

FIGURES:

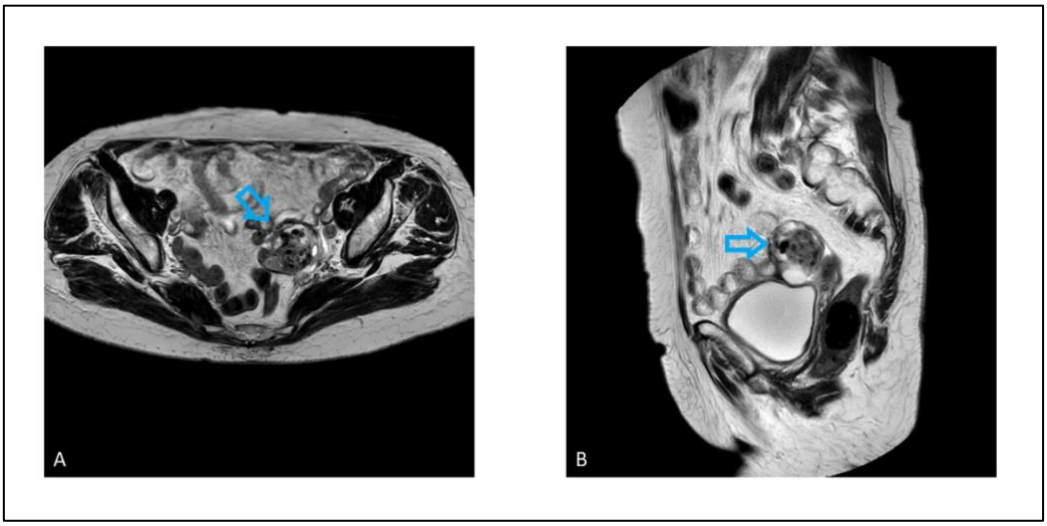


Figure 1. T2-weighted magnetic resonance imaging of the left adnexal mass.
Axial (A) and sagittal (B) T2-weighted images demonstrating a well-circumscribed, multiloculated left adnexal mass (blue arrows) with heterogeneous signal intensities among the locules, producing a "stained-glass" appearance.

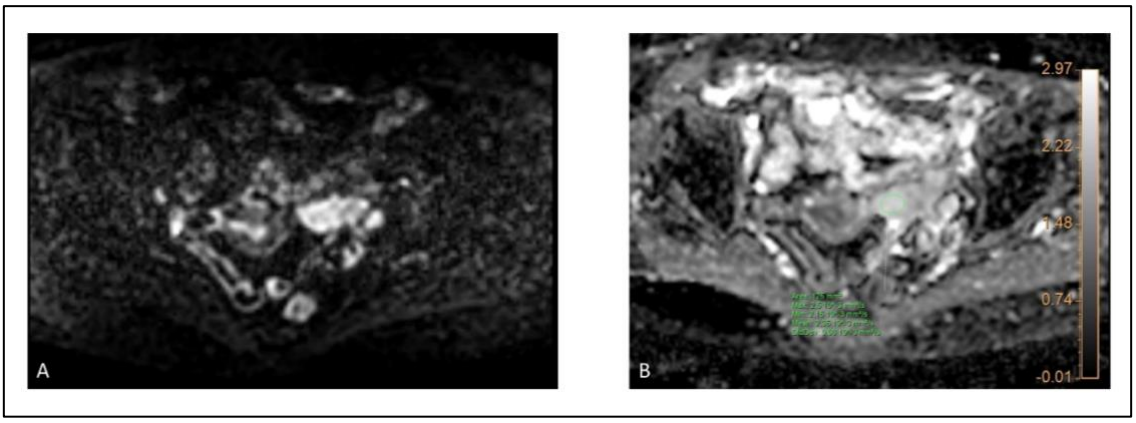


Figure 2. Diffusion weighted-imaging of the left adnexal mass.
Axial diffusion weighted image (A) demonstrating high signal intensity within the solid components, without corresponding low signal intensity on the apparent diffusion coefficient map (B), indicating the absence of true diffusion restriction.

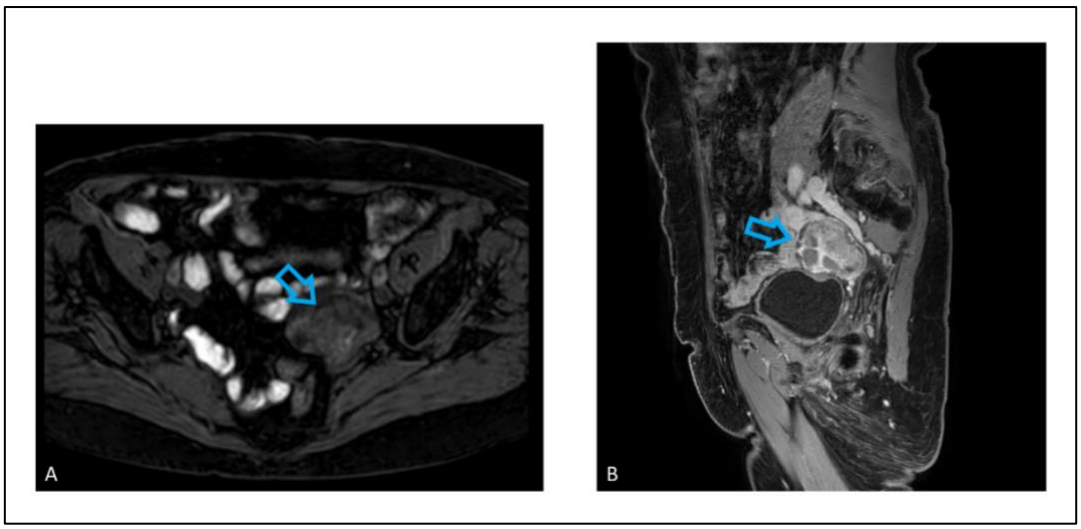


Figure 3. Pre- and post-contrast T1-weighted magnetic resonance imaging of the left adnexal mass. Axial (A) and sagittal (B) T1-weighted fat-suppressed images obtained before (A) and after (B) intravenous gadolinium administration, respectively, demonstrating avid enhancement of the solid components and septa.

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