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Case Report

The Pokéball Phenomenon: MRI Clues to Diagnosing Giant Ovarian Teratomas

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Abstract

We present a case of a giant ovarian teratoma in a 50-year-old patient, revealed by progressive abdominal distension. Imaging, especially MRI, was vital for diagnosis, especially due to the identification of the 'Pokémon Ball' sign, which is characteristic of mature teratomas. This case proves the vital role of MRI in the diagnosis of ovarian masses, showcasing its unparalleled performance in complex cases.

Keywords: *Pokémon Ball; Giant Ovarian Teratoma*

Introduction

Mature ovarian teratomas, also known as dermoid teratomas, are a prevalent form of benign germ cell tumours, constituting approximately 10 to 20% of ovarian tumours. The prevalence of these conditions is typically observed among women of childbearing age, although instances have been documented in postmenopausal patients as well. The diagnosis of this condition is primarily based on imaging, with ultrasound and MRI being the main modalities employed. MRI in particular is highly effective in providing detailed tissue characterisation. A recently described sign, known as the 'Pokémon Ball' sign, is a distinctive visual clue that strongly suggests the diagnosis [1,2].

Case Presentation

The case concerns a 50-year-old nulliparous woman with no significant medical history who presented with diffuse pelvic pain and progressive abdominal distension evolving over several years. Physical examination revealed a palpable abdominopelvic mass, without any associated systemic signs.

A subsequent pelvic ultrasound demonstrated a mixed abdominopelvic mass composed of two components: an anechoic cystic portion and a second, larger, poorly defined hyperechoic component.

Pelvic magnetic resonance imaging (MRI) revealed a large abdominopelvic mass measuring 30 × 40 × 20 cm, arising from the right ovary. The mass displayed a fluid–fat level with high signal intensity on T2-weighted images and signal loss on fat-saturated sequences—features indicative of a floating fat globule. This radiologic appearance corresponds to the so-called "Pokéball sign", a characteristic feature of mature cystic teratomas.

Given the chronic progression of symptoms, the patient's overall good clinical status, the absence of significant post-contrast enhancement, and the lack of restricted diffusion, a benign etiology was strongly favored. The patient was informed of the indication for surgical management via laparotomy but declined the procedure. A strategy of clinical and radiologic surveillance was subsequently proposed.

Discussion

Mature teratomas contain derivatives of the three embryonic layers, thereby explaining their rich content, which includes fat, hair, bone, cartilage, and occasionally teeth. The clinical presentation of these conditions is frequently non-specific or silent.

Ultrasound is the primary diagnostic modality employed initially, but its capacity to characterise the tumour is constrained. Conversely, MRI provides a comprehensive analysis of the internal composition of the mass due to its superior contrast resolution, enabling precise identification of fatty tissue (hyperintense in T1, signal loss in fat-sat sequence), soft tissue, calcifications (T2 hyposignal), and cystic structures [1].

The 'Pokémon Ball' sign, as described by Goudarzi., *et al.* (2015), corresponds to a concentric arrangement of different components (fat, keratin, fluid) reminiscent of the coloured layers of a Pokéball. This sign is suggestive of mature teratoma, although it is not pathognomonic [2].

Furthermore, imaging facilitates the assessment of complications, including rupture, torsion, or malignant transformation (a rare occurrence, with a prevalence of less than 2%). The following criteria are considered to support transformation: nodular enhancement, infiltration of adjacent structures, or metastases [3].

The differential diagnoses are as follows: epidermoid cysts, endometriomas, mucinous or serous cystadenomas, and immature teratomas. Imaging can facilitate diagnosis by virtue of suggestive features such as fat-fluid levels, calcifications (teeth, bones), or the Pokéball sign, which is highly specific to mature teratomas. Conversely, the presence of solid, irregular components with enhancement or restricted diffusion should raise suspicion of malignant transformation, which is rare but possible [1,3].

The standard treatment for mature cystic teratomas is surgical excision. In postmenopausal women or in the presence of large masses, oophorectomy is often the preferred surgical intervention in order to limit the risk of recurrence and rule out malignant transformation. It is generally recommended that a laparoscopic approach be adopted for small masses. However, a laparotomy is indicated for giant teratomas due to the nature of the procedure [4].

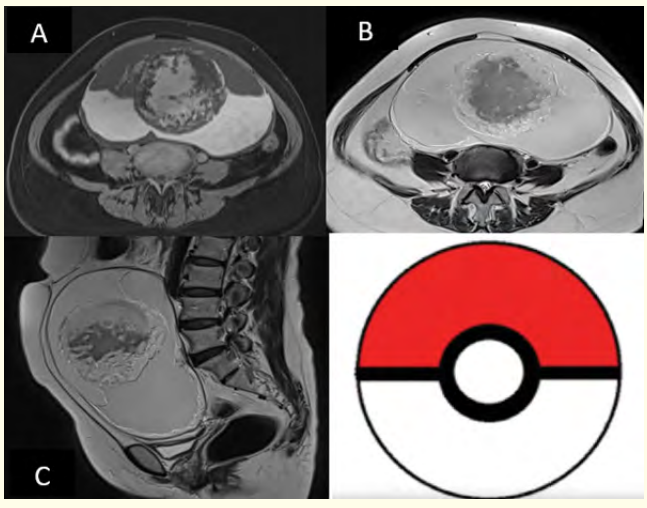

Figure: *Images from an abdominal-pelvic MRI in axial sequence (B), sagittal T2 (C) and axial T1 after fat saturation, showing a large abdominal-pelvic mass with a double liquid-fat component and a floating ball resembling a Pokémon ball sign associated with a mature teratoma.*

Conclusion

Imaging, particularly MRI, plays a fundamental role in the diagnosis of mature ovarian teratomas. The 'Pokémon Ball' sign, although not widely recognised, serves as a valuable clue in favour of the diagnosis. This case demonstrates the significance of MRI in the evaluation of complex pelvic masses and in surgical planning.

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