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Case Report

Endometrial Osseous Metaplasia: Diagnostic Dilemma of Unknown Etiology

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Abstract

Osseous metaplasia of the endometrium is a rare finding, yet a treatable cause of infertility and abnormal uterine bleeding. Very few cases have been reported from India. However, its frequency is thought to be underestimated due to both a lack of adequate clinic-radiological experience and the lack of pathological evidence available. We present two cases of endometrial osseous metaplasia to emphasize the radiological and pathological importance in the diagnosis of this rare treatable entity.

Key words: Endometrial osseous metaplasia, Endometrial ossification, Secondary infertility

INTRODUCTION

Endometrial osseous metaplasia (EOM) is a rare condition and is characterized by the presence of mature or immature bone in the endometrium.[1] It is also known as endometrial ossification, heterotopic intrauterine bone or ectopic intrauterine bone.[2]

Most commonly patients are asymptomatic or have abnormal uterine bleeding, often also the lesion is discovered during an investigation for infertility. The etiology is unclear but almost all reported cases have some obstetrical history.[1]

We present two cases of EOM, not associated with any obstetrical or gynecological history of maneuvers, discovered incidentally during evaluation of infertility and abnormal uterine bleeding.[3]

Very few cases of endometrial ossues metaplasia have been reported from India.We present two such cases to emphasize the radiological and pathological importance in the diagnosis of this rare treatable entity.[4]

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CASE DESCRIPTION AND RESULTS

A 23-year-old female patient presented with a history of primary infertility. She was married for 2 years and was nulliparous. Her menstrual history was regular without any dysmenorrhea or abnormal uterine bleeding. The general examination and bimanual exploration were normal. Hematological and endocrine work-up were also normal.

Supplementary tests for the possible explanation of abnormal calcifications also came out to be normal. Semen analysis of her husband was normal.

The ultrasonography (USG) report revealed the presence of a linear 3.2 cm hyperechoic structure with posterior acoustic shadowing in the body region of the uterus.

Histopathological examination of the endometrial curettage material was carried out. On gross, multiple irregular tiny hard-to-soft tissue bits were received, measuring 1.8 × 1.5 × 1.0 cm. On microscopic examination, hematoxylin and eosin (H&E) stained sections showed foci of bone formation and occasional endometrial glands surrounded by stroma that was in continuity with the bone formation. There was no evidence of any granuloma or endometritis.

A 38-year-old female patient presented with complaints of dysmenorrhea and heavy bleeding during menstruation

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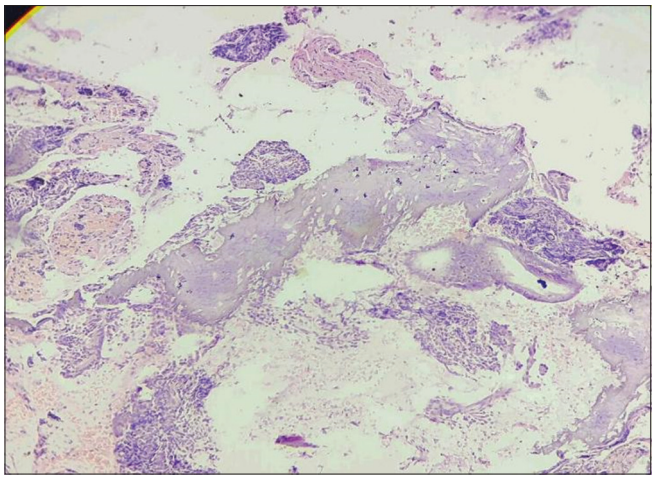

Figure 1: Hematoxylin and eosin stained section shows endometrial tissue comprising of broken endometrial glands in proliferative-phase and stroma. Interspersed within the stroma are few fragments of mature lamellar bone. Areas of haemorrhage along with few inflammatory infiltrates are also seen

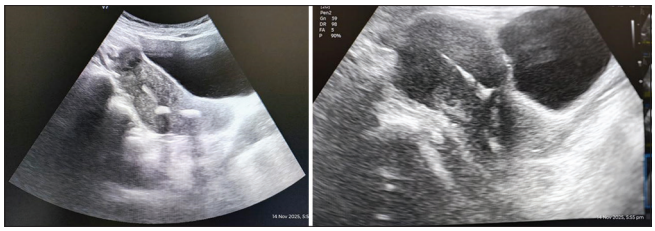

Figure 2: (a and b) Endometrial cavity shows multiple linear echogenic foci casting posterior acoustic shadowing, suggestive of calcified/osseous elements

for 4 months. She had a history of endometrial curettage due to heavy flow. General examination was normal. Mild anemia was seen on routine hematological work-up.

The USG report revealed the presence of few hyperechoic specks with posterior acoustic shadowing in the endometrial cavity region of the uterus.

Histopathological examination of the endometrial curettage material was carried out. On gross, multiple reddish brown soft-tissue bits were received, measuring 2.5 × 1.6 × 0.5 cm. On microscopic examination, H&E-stained sections showed predominantly hemorrhage with a few bits of bone formation and scattered broken endometrial glands surrounded by stroma that was in continuity with the bone formation. Mild chronic endometritis was also noted.

DISCUSSION

Endometrial osseous metaplasia (EOM) is a rare benign disorder defined by the presence of mature or immature bone within the endometrial cavity. Since its first description by Meyer in 1901, fewer than a hundred cases have been reported, with an estimated incidence of 0.02–0.3% among infertile women.[5,6]

The precise etiology remains uncertain, but several mechanisms have been proposed, including metaplastic transformation of endometrial stromal cells into osteoblasts, retention of fetal bone after miscarriage, and chronic endometritis.[7,8] The most widely accepted theory attributes it to osseous metaplasia of pluripotent stromal cells triggered by chronic inflammation or hormonal imbalance. Cytokines such as transforming growth factor-β and bone morphogenetic proteins may mediate osteoblastic differentiation.[9]

A prior history of abortion or uterine curettage is common in affected women, where residual fetal tissue may act as a chronic irritant. However, cases without such a history suggest pure metaplastic transformation.[6,7] Chronic endometritis due to infectious agents such as *Actinomyces* or *Mycobacterium tuberculosis,* has also been implicated.[8]

Clinically, EOM manifests most often as secondary infertility, menorrhagia, or pelvic pain. Osseous tissue may prevent implantation by mechanical interference and local endometrial irritation.[6,10] On USG, it appears as echogenic structures with posterior acoustic shadowing, but hysteroscopic examination with histopathology remains the diagnostic gold standard.[11]

Histologically, mature or immature bony trabeculae are seen within the stroma without atypia. The main differentials include retained products of conception, calcified fibroids, and malignant mixed Müllerian tumors with osseous differentiation.[7]

Hysteroscopic removal is both diagnostic and therapeutic, with excellent reproductive outcomes. Restoration of normal menstruation and spontaneous conception within months of removal are well documented, and recurrence is rare when removal is complete.[6,10,12]

This case highlights the importance of considering EOM in the differential diagnosis of infertility, especially in women with prior uterine instrumentation or miscarriage. Timely diagnosis and minimally invasive management ensure favorable outcomes.

CONCLUSION

EOM, although, represents an important reversible cause of infertility. Recognition of its characteristic clinical

and histopathological features, combined with minimally invasive hysteroscopic management, can result in excellent reproductive outcomes.

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