

Case Report

Osseous metaplasia of the endometrium – an unusual etiology of secondary infertility in a nulliparous woman

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ABSTRACT

The presence of bony tissue within the endometrium is an uncommon finding, usually uncovered during assessments for infertility. Most of the cases present with a clinical history of recurrent miscarriages, pelvic pain, dyspareunia, and menstrual irregularities, such as hypermenorrhea and dysmenorrhea. The other names of this rare entity are endometrial ossification, ectopic intrauterine bone, and heterotopic intrauterine bone formation. We present one such rare case with a review of the literature on a 21-year-old female presenting with secondary infertility. Endometrial osseous metaplasia should be considered in the differential diagnosis of intrauterine calcifications in women presenting with infertility or menstrual abnormalities. In the present case, ultrasonography demonstrated multiple linear calcifications with posterior acoustic shadowing in the lower endometrial cavity and endocervical junction. Hysteroscopy revealed four bony fragments, which were excised and sent for histopathological examination. The histopathological findings were consistent with endometrial osseous metaplasia. Hysteroscopic removal is considered the preferred treatment and may improve fertility by restoring the normal endometrial cavity.

Keywords: Endometrium, Infertility, Miscarriage, Endometrial ossification

INTRODUCTION

Endometrial osseous metaplasia is an uncommon condition characterized by the presence of both mature and immature bony fragments in the uterine lining. Nearly 100 cases have been reported in the literature to date, including nine from India.¹ It is also known by several other names including endometrial ossification, ectopic intrauterine bone, and heterotopic intrauterine bone.²

Various theories have been proposed for the pathogenesis or origin of ossification and the most accepted theory is the transformation of endometrial epithelial cells to mesenchymal osteoblastic cells producing bone. The clinical presentation is nonspecific and could be asymptomatic, menstrual irregularities, pelvic pain, dyspareunia, dysmenorrhea, and/or recurrent abortions.

The preferred treatment is the removal of bony spicules under hysteroscopic vision.

CASE REPORT

A 21-year-old female nulliparous P0A1 presented to the outpatient department of Obstetrics and Gynecology with complaints of irregular periods for 2 years with a history of scanty menses. Per abdomen findings were soft. Per speculum examination revealed circumoral erosion and white discharge; the vagina was healthy. On per vaginal examination, findings were normal. Ultrasonography revealed multiple linear calcifications causing posterior acoustic shadowing seen in the lower endometrial cavity and endocervical junction (Figure 1a). Bilateral ovaries were normal. Hematological findings were within normal limits. Hysteroscopy revealed the uterine cavity visualized

4 bony RPOCs ranging in size from 0.5 cm to 1 cm present in the left lower part of the uterine cavity (Figure 1b). The specimen was excised and sent to the histopathology lab.

Gross examination revealed red, multiple, fragmented bony bits ranging from 1.2×1.0×0.4 cm to 0.4×0.2×0.2 cm. Microscopy showed mature bony trabeculae with osteoblastic rimming, surrounded by endometrial stromal elements. Also, there were foci of endometrial glands with scant endometrial stroma, and chronic inflammatory cells were noted (Figure 1c). No chorionic villi or syncytiotrophoblasts were seen in the tissue examined. Overall histomorphological findings were consistent with endometrial osseous metaplasia.

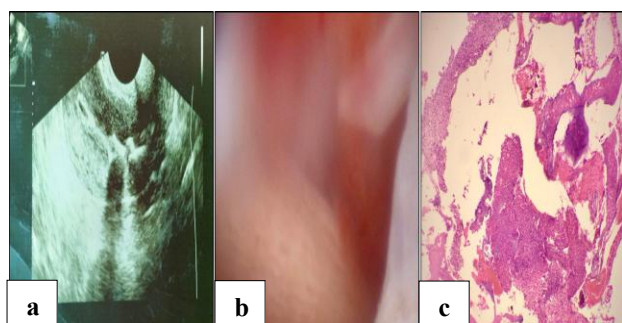


Figure 1: (a) USG revealed multiple linear calcification in endometrial cavity, (b) hysteroscopic image showing linear bony fragment inside the uterine cavity, and (c) histopathological findings showing bony trabeculae admixed with endometrial tissue (H&E, x400).

DISCUSSION

Endometrial osseous metaplasia (EOM) is a rare but important cause of secondary infertility, characterized by the presence of mature or immature bone tissue within the endometrial cavity. Fewer than 100 cases have been documented globally, with only a handful reported from India.^{1,3} The condition typically presents in women of reproductive age, often following a history of abortion or uterine instrumentation. However, cases in nulliparous women without obvious risk factors—such as the present case—highlight its unpredictable nature. In the absence of classic risk factors such as prior curettage, miscarriage, or endometritis, the diagnosis of EOM can be easily missed. Our patient presented with secondary infertility and menstrual irregularities. Ultrasonography played a key role in raising suspicion, revealing multiple echogenic foci in the lower endometrial cavity and the endocervical junction with posterior acoustic shadowing, suggestive of calcification. These findings were confirmed through hysteroscopic evaluation and histopathological examination, which showed mature bony trabeculae with osteoblastic rimming—consistent with EOM.

From a diagnostic perspective, the radiological appearance in this case is characteristic but not pathognomonic. Linear or curvilinear hyperechoic structures with posterior

acoustic shadowing on transvaginal ultrasonography have been described in patients with endometrial osseous metaplasia, and hysteroscopy permits direct visualization of the bony spicules and their complete removal. Similar ultrasound and hysteroscopic findings have been reported in published case reports and small series.^{4,5}

Histopathological examination is essential because the presence of bone in the uterine cavity does not by itself establish metaplastic origin. In women with a previous abortion, retained fetal skeletal tissue is an important differential consideration. The absence of chorionic villi and syncytiotrophoblasts in the present specimen, together with mature trabecular bone showing osteoblastic rimming in association with endometrial tissue, supports the diagnosis of osseous metaplasia rather than retained products of conception. The distinction between true osseous metaplasia and fetal bone has also been emphasized in previous pathological reports.⁶

The association with infertility is clinically relevant. Proposed mechanisms include a mechanical effect of bony fragments within the uterine cavity and alteration of the local endometrial environment, thereby interfering with implantation. Although the available evidence consists predominantly of case reports and small series, fertility has been reported after hysteroscopic removal. In a report of two cases, one patient conceived spontaneously six months after hysteroscopic resection, while another published case described spontaneous conception after removal of the bony fragments.^{4,7}

Recent pooled evidence is encouraging but should be interpreted cautiously because the literature is dominated by small observational studies. A 2026 systematic review of 37 studies involving 128 patients reported conception in 78.3% of 60 patients who pursued fertility after treatment, with most conceptions occurring spontaneously; however, the authors emphasized the limited quality and long-term evidence.⁸ In the present case, the patient was kept on follow-up after hysteroscopic removal of the bony fragments. Subsequently, she was able to conceive, suggesting a favorable reproductive outcome following treatment. Thus, hysteroscopic resection is a reasonable fertility-sparing treatment, while individual reproductive outcomes should be reported separately.

Most of the time (72.9% of presentations), endometrial osseous metaplasia is an unexpected finding during an infertility investigation.⁹ The majority of cases occur after a previous pregnancy, and it is strongly associated with secondary infertility.¹⁰ In most cases, this pathology occurs as a result of embryonic fetal bone persisting after birth.¹¹ By transforming the endometrial stroma into bony odd fragments, the blastocyst becomes unable to implant and survive in the uterus. This is due to the loss of nutrients provided by the normal endometrium.⁶ According to the literature, hysteroscopic resection of osseous metaplasia restores fertility in most cases.^{7,12} This is because it re-establishes the normal endometrial stroma and facilitates

blastocyst implantation.¹¹ This is why it is extremely important to correctly identify this condition in a woman who presents with secondary infertility.

Hysteroscopic removal is both diagnostic and therapeutic, and in many cases, fertility is restored following complete clearance of osseous fragments. Literature supports favorable outcomes post-intervention, especially when the diagnosis is made early and there are no concurrent causes of infertility.^{1,13} Following microscopic examination of uterine tissue, diagnosis depends on proper pathological identification of bone. In addition to HPE, ultrasonography is critical to diagnosing osseous metaplasia. Hyperechogenic pattern with posterior acoustic shadowing suggests osseous tissue in the uterus and requires confirmation through hysteroscopic examination.^{10,14} The diagnosis of EOM requires a combination of clinical suspicion, targeted imaging, and confirmatory histopathology.

CONCLUSION

Infertility secondary to endometrial osseous metaplasia is uncommon but may be curable. Although often associated with prior obstetric events, it may present in young nulliparous women without classic risk factors. Diagnosis requires a high index of suspicion, supported by imaging and confirmed through histopathology. Hysteroscopic removal remains the mainstay of treatment, and timely intervention can restore fertility and improve clinical outcomes.

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REFERENCES

- Patil SB, Narchal S, Paricharak DG, More SS. Endometrial osseous metaplasia: Case report with literature review. *Ann Med Health Sci Res*. 2013;3:S10-2.
- Damiani GR, Gennaro DD, Malvasi A, Vimercati A, Loizzi V, Gaetani M, et al. Endometrial Osseous Metaplasia: An Hysteroscopic Incidental Finding - An Overview. *Gynecol Minim Invasive Ther*. 2023;12(4):243-5.
- Sharma S, Gupta P, Khurana N, Dey P. Osseous metaplasia of endometrium and uterine cervical epithelium: a report of two cases. *J Turk Ger Gynecol Assoc*. 2012;13(1):71-3.
- Madaan M, Suman S, Sharma R, Kapoor N, Garg P, Raj SS. Osseous metaplasia of the endometrium and successful hysteroscopic resection: a report of two cases and a review of the literature. *Asian J Endosc Surg*. 2015;8(1):63-6.
- Presannakumari B, Pappachan C, Hassan J, Subhash R. Osseous metaplasia of endometrium: An unusual cause of secondary infertility. *Int J Gynaecol Obstet*. 2024;167(1):62-5.
- Cayuela E, Perez-Medina T, Vilanova J, Alejo M, Cañadas P. True osseous metaplasia of the endometrium: the bone is not from a fetus. *Fertil Steril*. 2009;91(3):1293.e1-e4.
- Garg D, Bekker G, Akselrod F, Narasimhulu DM. Endometrial osseous metaplasia: an unusual cause of infertility. *BMJ Case Rep*. 2015;2015:bcr2015209523.
- Farooqi S, Elanganesan P, Mehra VM, Murji A. Effects on Gynecologic Symptoms and Infertility in the Treatment of Endometrial Osseous Metaplasia: A Systematic Review of Case Reports and Small Series. *J Obstet Gynaecol Can*. 2026;4:103240.
- Pereira MC, Vaz MM, Miranda SP, Araújo SR, Menezes DB, das Chagas Medeiros F. Uterine cavity calcifications: a report of 7 cases and a systematic literature review. *J Minim Invasive Gynecol*. 2014;21(3):346-52.
- Garzon S, Laganà AS, Carugno J, Cayuela Font E, Jimenez J, Kar S, et al. Osseous metaplasia of the endometrium: A multicenter retrospective study. *Eur J Obstet Gynecol Reprod Biol*. 2021;265:150-5.
- Umashankar T, Patted S, Handigund R. Endometrial osseous metaplasia: Clinicopathological study of a case and literature review. *J Hum Reprod Sci*. 2010;3:102-4.
- Creux H, Hugues JN, Sifer C, Cédric-Durnerin I, Poncet C. Fertility after endometrial osseous metaplasia elective hysteroscopic resection. *Gynecol Obstet Fertil*. 2010;38(7-8):460-4.
- Reddy M, Sasidharan K, Nambiar S, George A. Endometrial osseous metaplasia: Case series and literature review. *J Hum Reprod Sci*. 2019;12(4):327-30.
- Rosa-E-Silva JC, Barcelos ID, Navarro PA, Rosa-E-Silva AC, Nogueira AA, Ferriani RA. Osseous metaplasia of the endometrium associated with infertility: a case report and review of the literature. *J Med Case Rep*. 2009;3:7427.

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