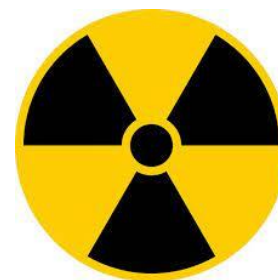




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ENDOMETRIAL OSSEOUS METAPLASIA: TWO CASE REPORTS AND LITERATURE REVIEW

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ABSTRACT

Endometrial osseous metaplasia (EOM), sometimes called endometrial microcalcifications or endometrial calcinosis, is a rare pathological condition characterized by the presence of osseous tissues within the endometrium and a major cause of infertility and menorrhagia in women. The objective of the reports was to describe and report two cases with a brief review of literature in 24- and 25-year-old women in Jos, North Central Nigeria. The first case presented with the history of secondary infertility following a cesarean section, and the second presented with a history of recurrent miscarriages. Both cases were encountered and evaluated in a private healthcare facility in Jos between March and October 2025. Histopathological evaluation demonstrated the presence of mature osseous tissue interspersed with endometrial glands and proliferative endometrium. Serial sonograms consistently demonstrated a concentric and irregularly shaped hyperechogenic endometrial plate with posterior acoustic shadowing. These sonographic features are well characterized in literature for EOM. While ultrasound is a veritable tool for suggesting EOM, a definitive diagnosis is confirmed by a hysteroscopy and histopathological evaluation.

Keywords: Endometrial osseous metaplasia, endometrial microcalcifications, secondary infertility, miscarriage, ultrasound.

Introduction

Infertility in Nigeria is a significant health concern, with prevalence rates varying across locations and studies. National estimates of infertility range from 10% to 30 %, with a prevalent rate of 23.9% reported in Northern Nigeria and 14.8% in Southern Nigeria. It is further reported that 38.2% of infertile women are experiencing primary infertility and 61.8% having secondary infertility. Various factors contribute to infertility, including tubal factor, uterine or ovarian factors, sexually transmitted infections (STIs), ovulation disorders, hormonal imbalances, lifestyle, environmental factors and endometrial osseous hyperplasia among other causes.¹⁻³

Endometrial osseous metaplasia also termed endometrial ossification, ectopic intrauterine bone, endometrial microcalcifications and heterotopic intrauterine bone is an endogenous nonspecific pathological disorder.⁴⁻⁶ It is considered a cytomorphological transformation of uterine epithelial cells from the usual endometrial phenotype to bone-type mesenchymal elements, characterized by the presence of matured or immature ectopic bone tissue within the endometrium.⁷ Its prevalence is very low with an incidence of 3/10,000 and less than 100 cases been reported in literature. Studies have linked this condition to abortion since 1923, with more than 80% of affected women said to have an antecedent history

of first trimester abortion, either spontaneous or induced, may be related to retained fetal tissue or dystrophic ossification. Studies conducted by Olalekan et al, 2021, highlighted the rarity of this condition but also its significance as a cause of secondary infertility, often preceded by pregnancy termination.

It has been reported also in women with no history of prior pregnancy. It has also been reported in the menopausal years as well. Hormonal or exogenous stimuli (intrauterine contraceptive device) are thought to be the main inducing factors of endometrial stroma metaplasia; although, some metaplasia have a mutation origin.⁸⁻⁹

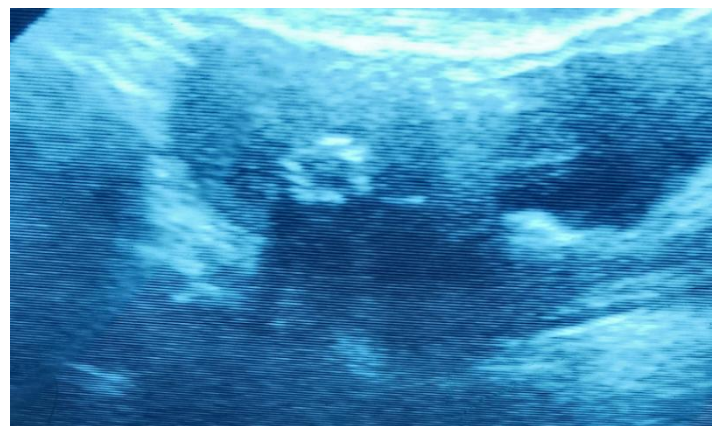
The main sonographic finding in endometrial osseous metaplasia is the presence of a strongly echogenic or hyperechoic, linear or irregular endometrial plate with posterior acoustic shadowing, assuming the presence of intrauterine contraceptive device as main differential diagnosis. Other possible diagnoses include presence of foreign bodies, Asherman's syndrome, calcified submucosal fibroid, and Mullerian tumor according to reports. However, the suspicion of endometrial osseous metaplasia is high in cases of strong, hyperechogenic linear or irregularly shaped endometrium with posterior acoustic shadowing on ultrasound, in women with history of miscarriage and chronic endometriosis.⁴ With low incidence reported globally, literature showed limited data of reported cases of this condition in Nigeria, to the best of the author's knowledge.

Case Reports

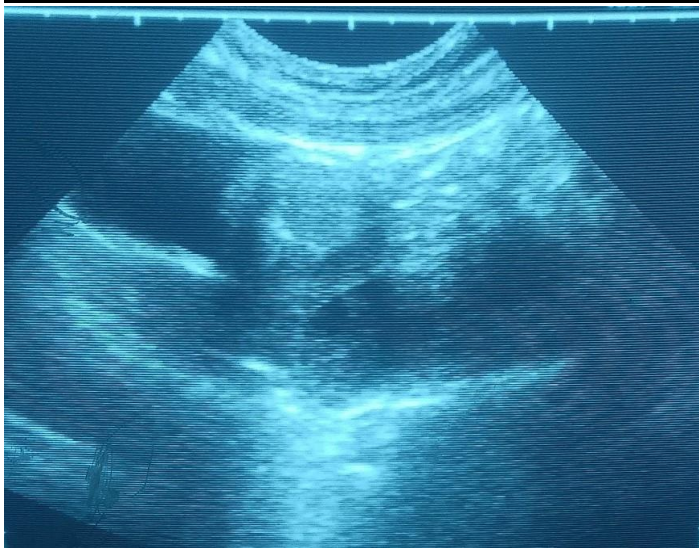
A 24-year-old woman presented with history of irregular menstruation. She was married for five years and has had history of recurrent miscarriage. Her general examination was normal. Serial ultrasounds were done and sonogram consistently showed concentric hyperechogenic endometrial plate that measured 1.7 X 1.6cm, with posterior acoustic shadowing (Figure 1). Dilatation and curettage, with histopathological analysis was performed. Histopathological results showed presence of mature osseous tissue interspersed with endometrial glands and proliferative endometrium. A repeat ultrasound was performed for seven months post dilatation and

curettage (D&C). Sonogram showed a linear hyperechoic endometrial plate with weak posterior acoustic shadowing. There was no adnexal mass. However, significant collection of anechoic fluid was noted at the posterior cul-de-sac (Figure 2).

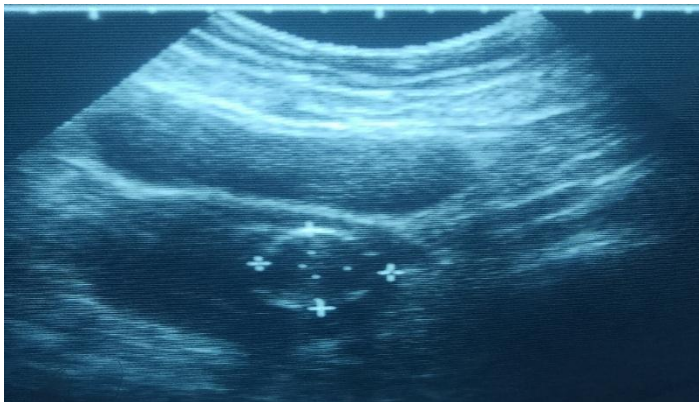
The second case was a 25-year-old woman who presented with a history of secondary three month's amenorrhea. No history of dysmenorrhea or menorrhagia. She was initially managed for pelvic inflammatory disease in a Private Healthcare facility in Jos, Plateau State. Sonogram revealed an anteverted uterus with homogenous myometrial echogenicity. A ring-shaped hyperechogenic endometrial mass with posterior acoustic shadowing was demonstrated. The mass measured 3.3X 3.0cm. Both Adnexa showed no evidence of masses, though mild fluid was noted at the pouch of Douglas. Normal urinary bladder and other pelvic structures were essentially normal (Figure 3).



CASE 1: Figure 1-Pelvic ultrasound of a 24-year-old woman, irregular menstruation and recurrent abortion. Sonogram shows a ring-shaped (concentric) hyperechogenic endometrial mass with posterior acoustic shadowing, with differential of endometrial osseous metaplasia (endometrial calcinosis/endometrial microcalcifications).



CASE 1: Figure 2: Pelvic sonogram of a 24-year-old woman, post Dilatation and Curettage. Sonogram shows a linear hyperechogenic endometrial plate with weak posterior acoustic shadowing. Also demonstrated was a collection at the posterior cul-de sac.



CASE 2: Figure 3-Pelvic sonogram of a 25-year-old female, 3 months' amenorrhea. Sonogram shows a ring-shaped hyperechogenic mass within the endometrium with posterior acoustic shadows.

Discussion

Endometrial osseous metaplasia (EOM) can be seen more frequently but mistaken for intrauterine devices, Asherman's syndrome, or endometritis, especially in the very underreported and inexperienced cases and practitioners, respectively.

Our cases presented history of irregular menstruation with recurrent miscarriages. They were both in their sexually active and reproductive ages. These were similar to cases presented in literature, and incidence of this condition have been reported to increase with age.^{3,4,7,8} It is postulated that the cytomorphological transformation of the uterine epithelial cells and the inflammatory and reparative processes which precipitate endometrial osseous metaplasia induce

abortion. Some pathogenetic theories consider these transformational changes as an adaptive change of the endometrium in response to changes in the endometrial environment. It further postulated that many of the endometrial elements, especially those derived from Mullerian ducts or fibroblasts, could transform into chondroblasts or osteoblasts.^{17,19} Additionally, studies also suggested that continuous and constant endometrial estrogenic stimulation, retention of foetal bones that promotes osteogenesis in the surrounding endometrium, dystrophic calcification of retained and necrotic tissues following one or more miscarriages, metabolic disorders such as hypercalcemia, hypervitaminosis D or hyperphosphatemia among others could be responsible for this condition's pathogenesis.¹⁹ Literature further showed that the time interval between antecedent abortion and discovery of endometrial ossification could vary from eight weeks to fourteen years in the reproductive age group.²⁰

Although, more than 80% of reported cases have antecedent history of first trimester abortion, either spontaneous or induced, cases have been reported in women with no history of prior pregnancy.²¹

Ultrasonography plays an important role in the diagnosis of this condition with histological analysis. Our studies demonstrated concentric or irregularly shaped hyperechogenic endometrial plate with posterior acoustic shadowing, prior to curettage (Figures 1 and 3). These features are strongly indicative of calcifications or retained bone tissues within the endometrial cavity.

Studies by Guerra et al⁴ reported cases showing strongly echogenic endometrial plates which were confirmed by histopathological analysis from patients with history of miscarriages and chronic endometriosis. These studies are similar to our findings. A transvaginal ultrasound scan study by Olalekan et al¹⁰ revealed a linear echogenic structure with the median aspect of the mass in the posterior endometrium. These features further agree with our findings. Several other studies also showed markedly increased or hyperechogenic of the endometrium with posterior acoustic shadowing, which were consistent with our findings.⁹⁻¹⁴

Overall, our findings are in line with other reported cases which showed structures within the endometrium which confirmed by histopathological analysis as endometrial osseous metaplasia (EOM). 20-23.

Although, endometrial osseous metaplasia could easily be mistaken for intrauterine contraceptive devices^{10, 22}, Asherman's syndrome, calcified submucosal fibrosis, metastatic or dystrophic calcification from high calcium levels in the blood and Mullerian tumour show similar features due to its low reported incidence. Patient's clinical history such as recurrent miscarriages, or chronic inflammation, however, could differentiate and strongly support EOM. While ultrasound is a veritable tool for suggesting EOM, a definitive diagnosis is confirmed by confirmed by a hysteroscopy and histopathological evaluation.^{7,11,22}

Conclusion

Endometrial osseous is an uncommon clinical entity, shown to be a treatable cause of infertility. Though low in incident, especially in our region, its ultrasonographic features which consist of linear, irregular areas within the endometrial plate with posterior acoustic shadowing are well characterized and documented in the literature. Our present studies depicted these features, which should serve as a useful guide to clinicians.

References

1. Dattijo LM, Andreaddis N, Aminu BM, Umar NI, Black KI. The prevalence and clinical pattern of infertility in Bauchi, northern Nigeria. *Tropical journal of obstetrics and gynaecology*. Volume 33 No.1 (2016)
2. Amadi Lucky, Raji Farouk, Oladeji Oluwaseyi Isaiah. O, Sule-Odu. The effects of infertility on the quality of life of women: A comparative study in a Nigerian Tertiary Healthcare Centre. *Nigerian journal OF MEDICINE*, 34(1):38-44
3. Sule J O, Erigbali P, Eruom L. Prevalence of infertility in women in a Southwestern Nigerian Community. *African Journal of Biomedical Research*, vol.11(2008);225-227
4. Gurerra LFA, Lais Batos Pessanha, Gabriel Antonio de Oliveira, Andriana Maria, Fonseca de

Melo, Flavia Silva Braga, Rodrigo Stenio Moll de Souza. Endometrial osseous metaplasia: sonographic, radiological and histopathological findings. *Radiol Bras*. 2016;49(1):62-63

5. Umashankar T, Patted s, Handigund R. Endometrial osseous metaplasia: clinicopathological study of case and literature review. *J Hum Reprod Sci*. 2010;3(2):102-4
6. Nicolae A, Preda O, Nogales FF. Endometrial metaplasias and reactive changes: A spectrum of altered differentiation. *J Clin Pathol* 2011;64:97-106
7. Patil S, Naechal S, Parcharak D, More S. Endometrial Osseous Metaplasia: Case report with literature review. *Ann Med Health Sci Res*. 2013; 3(suppl 1):S 10-2
8. Cayuela et al. True osseous metaplasia of the endometrium: the bone is not from a fetus. *Fertile Steril*. 2009; 91(4):1293. el-4. PubMed
9. Shroff CP, Kudterkar NG, Badhwar VR. Endometrial ossification-report of three cases with literature review. *Indian J Microbiol*. 1985;28(1):71-4
10. Olalekan Abisola Ajaiyi et al. Endometrial osseous metaplasia complicated by secondary infertility: a case report. *Pan Afr Medical Journal*, 2021
11. Garg D, Bekker G, Akseirod F, Narasimhulu D. Endometrial Osseous metaplasia: an usual cause of infertility. *BMJ Case report*. 2015;2015(apr 012):bcr 2015-209532
12. Truskinovsky AM, Gerscovich EO, Duffield CR et al. endometrial microcalcifications detected by ultrasonography: clinical associations, histopathology, and potential etiology. *International journal Gynecol. Pathol*. 2008;27(1):61-7
13. Duffield C, Gerscovich E, Gillen M, McGahan J, Truskinovsky A. Endometrial and endocervical micro echogenic foci: sonographic appearance with clinical and histologic correlation *J Ultrasound Med*. 2005;24(5): 583-90. Doi: 10.7863/jum.2005.24.5.583-
14. Williams P, Laifa-Narin S, Ragavendra N. Ultrasound of abnormal uterine bleeding. *Radiographics*. 2003;23(3):703-18
15. Pereica MC, Vaz MM, Miranda SP, Araujo SR, Menezes DB, das Chagas Medeiros F. Uterine cavity

calcifications: a report of 7 cases and a systemic literature review. *Journal of minimal invasive gynecology*.2014;21(3):346-52

16. Burk DD, Stainken BF, Burkhard TK, Balsara ZN. Uterine inner myometrial echogenic foci. Relationship to prior dilatation and curettage and endocervical biopsy. *Journal of ultrasound in medicine: official journal of American Institute of Ultrasound in Medicine*. 1991;10(9):487-92

17. Bahceci M, Demirel LC. Osseous metaplasia of the endometrium: A rare cause of infertility and its hysteroscopic management. *Hum Reprod* 1996;11:2537-9

18. Grigore M, Pristavu A, Gafitanu D. Ultrasound features of osseous metaplasia of the endometrium – case series and review of the literature. *Clin Imaging* 2018; 52:260-3

19. Gianluca Raffaello, Daniele DI Gennaro, Antonella Vimercati et al. endometrial Ossoeus

Metaplasia: An hysteroscopic incidental finding-An overview. *Gynecol Minim Invasive Ther*.2025,feb 27;14(1):101

20. Damiani GR, Tartagni M, Crescenzi C, Persiani P, Loverro G, Von Wunster S. Itussusception and incarceration of a fallopian tube: Reports of 2 atypical cases, with differential considerations, clinical evaluation, and current management strategies. *J Minim Invasive Gynecol* 2011;18:246-9

21. Shroff CP, Kudterkar NG, Badhwar VR. Endometrial ossification –report of three cases with literature review. *Indian J Pathol Microbiol*. 1985 Jan;28(1):71-4

22. Imaralu JO, Solajis T, Ayegbusi O, Grillo OE, Atunrase-Sotola R, Elejere TC. When hysteroscopy is the only way out; a case series of endometrial osseous hyperplasia. *Babcock Uni. Med. J*. 2024;7(2):60-65