Section: Pathology

Case Series

ENDOMETRIAL OSSEOUS METAPLASIA: CASE SERIES OF HISTOPATHOLOGICAL STUDY

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Abstract

Background: The aim is to study histopathology of endometrial osseous metaplasia (EOM). **Materials and Methods:** This study analyzed cases of EOM in hysterectomy specimens and endometrial curettages diagnosed in a tertiary centre. **Result:** A total of 5 cases of EOM were studied in hysterectomy specimens and endometrial curettages among the age range of 32 to 65 year. Among them, patients aged 39, 44, and 45 years presented with abnormal uterine bleeding (AUB), the 32-year-old woman exhibited secondary infertility, while the 65-year-old patient presented with uterine prolapse. The gross examination of three AUB cases of hysterectomy specimens revealed thickened endometrium with multiple gritty areas. The endometrial curettings of patient with infertility showed dark brown soft and bony tissue pieces. The endometrium of one of the postmenopausal hysterectomy showed thin endometrium. The histopathological examination was consistent with osseous metaplasia of the endometrium of all the cases. **Conclusion:** Endometrial ossification is a rare finding that needs to be differentiated from the retained fetal bones after abortions, retained intrauterine devices, malignant mesenchymal tumour (MMMT) and uterine teratoma. Therefore it should be taken into consideration.

INTRODUCTION

Osseous metaplasia is defined as the presence of bone in the soft tissue.1,2 Endometrial osseous metaplasia (EOM) is a condition characterized by the presence of mature and immature bone in the endometrium.1,2 It is also known as ectopic intrauterine bone, endometrial ossification, heterotopic intrauterine bone3. EOM is most often found in reproductive, perimenopausal age group as well as in post menopausal women.4 The clinical presentation ranges from asymptomatic to symptoms like pelvic pain, abnormal uterine bleeding, infertility, and abortions.1,4 EOM should be differentiated from the other entities such as uterine teratoma in reproductive age group and malignant mixed mesodermal tumours in postmenopausal age group. EOM has been speculated to have a relationship with pluripotent endometrial stromal cells, osteogenesis associated with inflammation, as pro-inflammatory mediators like cytokines such as tumour necrosis factor α and superoxide free radicals will decrease the activity of superoxide dismutase which further causes osteogenesis.2,4

CASE REPORTS

CASE 1: A 32-year-old female presented with secondary infertility. She presented with bleeding per vaginum. She had history of ammenorhea since nine weeks and her urine pregnancy test (UPT) was positive. She had one live birth by lower segment cesarean section (LSCS) four years back and three abortions with dilatation and curettages (D&C) in the past three years. D&C was done and sent for histopathological examination (HPE). The ultrasonography showed coarse calcifications in the lower one-third of the endometrium. On gross examination, the endometrial curettings comprised of multiple greyish white to dark brown soft and bony tissue pieces together measuring 2x1.5x0.5cms. On microscopy, there was EOM showing multiple bony trabeculae with hematopoietic tissues along with interval phase thin endometrium. [Figure 1]. No glial tissue or any trophoblastic tissue was present, hence indicating no retained products of conception. No granulomas identified in the sections studied.

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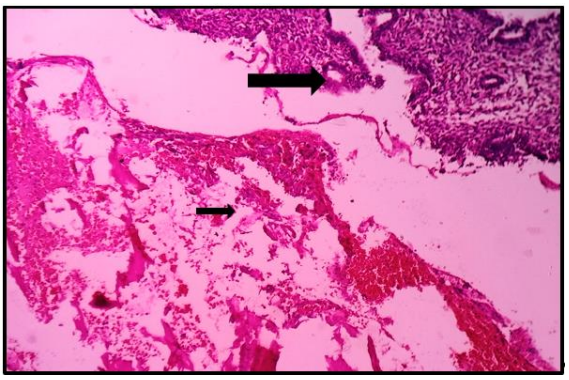

Figure 1: (Photomicrograph having large arrow showing endometrium in interval phase, smaller arrow depicting the bony trabeculae.)

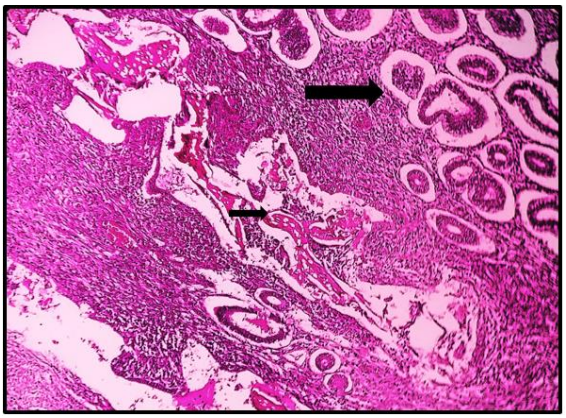

Figure 2: (Photomicrograph having larger arrow which shows endometrium in secretory phase and smaller arrow shows bony trabeculae)

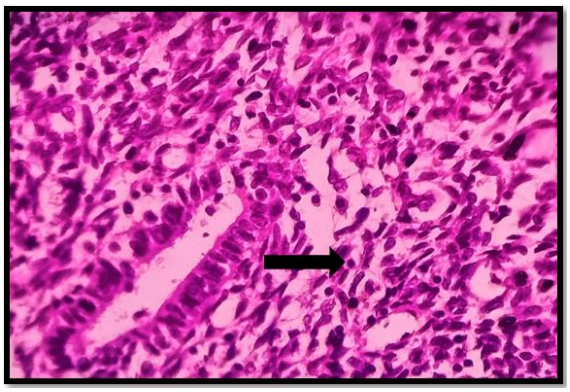

Figure 3: (Photomicrograph showing plasma cells and lymphocytes)

CASE 2: A 39-year-old female presented with AUB and pain in the lower abdomen for two years. Total abdominal hysterectomy (TAH) along right salpingectomy was done and sent for HPE. The cervix was hypertrophied. On serial sections of uterus, there was thick endometrium with dark brown to greyish white material filling and dilating the endometrial cavity along with thickened myometrium. On microscopic examination, there was osseous metaplasia showing bony trabeculae with secretory phase endometrium, (Figure 2) along with acute on chronic cervicitis, micro glandular endocervical hyperplasia, papillary endocervicitis, Nabothian follicles along with chronic salpingitis,

CASE 3: A 44 yr old female presented with AUB since 4 months. TAH was done and sent for histopathological examination(HPE). The specimen showed hypertrophied cervix. On serial sections there was thin endometrium and multiple greyish white to dark brown gritty tissue pieces filling the endometrial cavity. On microcsopy, there was acute on chronic cervicitis, papillary endocervicitis along with chronic endometritis with EOM. [Figure 3].

CASE 4: A 45yr old female presented with AUB since 6 months. TAH with right side adnexa was received. Grossly, uterus was globular with cervix was hypertrophied. Serial sections through the uterus showed distorted endometrial cavity filled with multiple greyish white to dark brown gritty tissue pieces along with a submucosal fibroid measuring 2cms in diameter. Maximum myometrial thickness in the wall free of fibroid was 4cms. On microscopy, there was acute on chronic cervicitis with focal ulceration along with EOM with secretory phase endometrium along with a submucosal leiomyoma and adenomyosis in uterine myometrium. The fallopian tube showed chronic salpingitis and histologically unremarkable ovary. [Figure 2].

CASE 5: A 65yr old female presented with uterine prolapse and underwent vaginal hysterectomy with pelvic floor repair. TAH was done and specimen sent for HPE. Grossly, the cervix was hypertrophied, elongated and keratinized. On serial sections, thin atrophic endometrium along with multiple bony hard tissue pieces filling the endometrial cavity were present. On microscopy, acute on chronic cervicitis with focal ulceration and squamous metaplasia was present. The covering epithelium was hypertrophied and keratinised, compatible with prolapse, uterus. The endometrium showed small atrophic glands cystically dilated with EOM as an incidental finding.

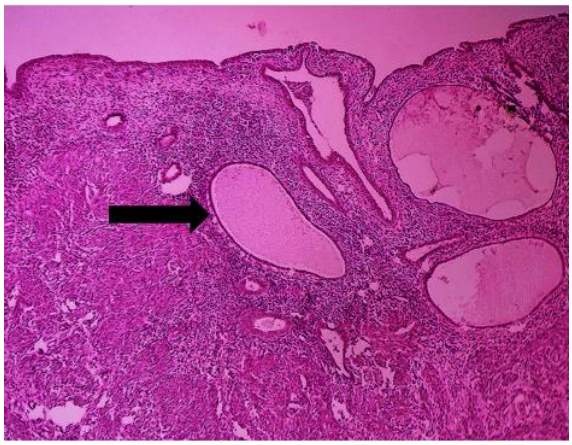

Figure 4: (Arrow is showing cystic atrophy endometrium).

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Table 1: Summary of all cases with EOM.

Case number	Age (years)	Chief complaints	Specimen	Opinion
1	32	Secondary infertility	Endometrial curretings	EOM with interval phase endometrium
2	39	AUB	Hysterectomy with right salpingectomy	EOM with secretory phase
3	44	AUB	Hysterectomy	EOM with chronic endometritis
4	45	AUB	Hysterectomy with right side adnexa	EOM with secretory phase endometrium
5	65	Uterine prolapse	Hysterectomy	EOM, cystic atropy

DISCUSSION

Osseous metaplasia (OM) is defined as the presence of heterotopic bone in the soft tissue. EOM is presence of mature and immature bone in the endometrium.[1,2] Endometrial metaplasia are of mainly two types- Epithelial metaplasia and non-epithelial metaplasia. EOM is a sub-type of non-epithelial metaplasia.[3] The EOM is endogenous nonneoplastic pathological condition in which there is cytomorphological transformation of uterine stromal cells from the endometrial phenotype to bone type mesenchymal phenotype.[3,4] OM affects various sites in female genital tract like cervix, endometrium, vagina, ovary and mesosalpinx.[4,5]

It has been documented across various age groups, including reproductive-age, perimenopausal and those in the postmenopausal phase.[3,4] Four of our cases diagnosed with EOM are in reproductive age group and one is in postmenopausal group which are consistent with findings by Gautam H et al.(2019) and Anant M et al. (2017).[1,6]

Our age ranges from 32 years to 65 year which are consistent with two of studies.[3,4]

Clinical presentation includes AUB, pelvic pain, secondary infertility and even as incidental finding on ultrasonography.[1] AUB was observed in four of reproductive age group and one postmenopausal group findings of which are consistent with findings by Gautam H et al.(2019) and Anant M et al. (2017).[1,6] Studies by Anant M et al. (2017) and Sood A et al. (2019) have reported similar cases of infertility associated with EOM.[5,6]

The suggestive causes of infertility is that the new bone formation can cause the reactive endometritis which can cause problem in blastocyst implantation.[2] EOM is one of the uncommon cause of infertility with incidence of 0.02% in India.[2]

Plausible explanations for its etiopathogenesis include the transformation of pluripotent endometrial stromal cells particularly fibroblasts into osteoblasts.[4] Some studies suggested associations with prolonged estrogen therapy can cause the osteogenisis of endometrium.[4]

The DNA analysis of bony tissue pieces near the endometrium showed that the tissue is of maternal origin causing EOM.[2]

Some of the studies suggested that whenever there is remaining fetal tissue in the endometrium it can cause chronic endometritis which can further lead to release of proinflammatory mediators mainly cytokines like tumour necrosis factor alpha (TNF α) and free superoxide radicals which induce chronic endometritis and can cause metaplasia of endometrial tissue and converting the fibroblast into osteoblast.[2]

A study shows induction of osteogenesis by body's own embryonal cells can also cause osseous differentiation of endometrial cells.[2]

One of theory suggests the organism induced EOM is suggested. Main organism is streptococcus agalactiae, they can resist the phagocytosis and this bacterium killing process can cause apoptosis and necrosis which further leads to deposition of calcium and formation of bone.[4]

It is suggested that the cells which are derived from the mullerian ducts are having more ability to transform into osteoblast.4 In some cases, tuberculosis, reactive endometritis can cause osseous metaplasia.[4]

CONCLUSION

EOM can lead to menstrual irregularities, pain, and difficulties in conception when intrauterine bone formation occurs.[1,2]

Chronic endometritis can trigger metaplastic alterations in pleuripotent endometrial stromal cells, prompting their transformation into osteoblastic cells, which subsequently deposit bone.[4]

EOM should not be misdiagnosed as asherman' s syndrome, as a intrauterine device , calcified submucosal fibroid, and as a mullerian tumour.[4] This metaplastic process can result in the formation of intrauterine bone.[4]. It's crucial to differentiate this condition from retained fetal bones, malignant mesenchymal tumors (MMTs), gliosis, teratomas, endometrial tuberculosis.[1]

REFERENCES

1. Gautam H, Goswami A, Goswami P, Kathar KK. Endometrial osseous metaplasia in a case of abnormal uterine bleeding. Int J Reprod Contracept Obstet Gynecol. 2019;8:4596-8.
2. Tica VI, Postolache I, Boșoteanu M, Aschie M, Tica I, Orasanu CI, et al. Endometrial Osseous Metaplasia-A Rare Cause of Infertility with Unknown Etiology. Medicina. 2023;59:1803-11.
3. Patil S, Narchal S, Paricharak D, More S. Endometrial osseous metaplasia: case report with literature review. Ann Med Health Sci Res. 2013;3:10-2.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

4. 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;12:243-5.
5. Sood A, Lewis E, Grey B, Mohiyiddeen L. Novel Management of Endometrial Osseous Metaplasia. World J Surg Surgical Res. 2019;2:1164-5.
6. Anant M, Singh A. Osseous endometrium presenting as menorrhagia, successful outcome by hysteroscopy: a case report and review. Int Surg J. 2017;4:3573-5.
7. Khan SN, Modi M. Hoyos LR. Imuda AN, Awonuga AO. Bone in the endometrium: Review. Int J Fertil Steril. 2016;10:154-61.
8. Wani AH, Parry AH, Fero I, Jehangir M, Rashid M. Imaging of endometrial osseous metaplasia- An uncommon but treatable cause of infertility. Middle East Fert J. 2020;25;35-45.
9. Umashankar T, Shobhana P, Handigund RS.Endometrial osseous metaplasia: Clinipathological study of a case and literature review. J Hum Repord Sci. 2010;3:102-4.

ISSN (O): 2687-5365; ISSN (P): 2753-6556