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# Morphology af Endometrial Metaplasias and Related Reactive Changes: A Prospective Study

KEYWORDS: Endometrial curettings, Endometrial metaplasias, microscopy

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**ABSTRACT** *Introduction: Endometrial metaplasias comprise a morphologically heterogeneous group of proliferations and differentiations found in eutopic and ectopic endometrium involving epithelium and stroma. The aim of the present study was*

1. *To study the pattern and relative incidence of endometrial metaplastic lesions and reactive changes.*
2. *To study their association with different lesions in female genital tract.*

*Methodology: Endometrial curettings were processed as such. Fixation was done in 10% buffered formol saline. After tissue processing multiple 4-5mm thick paraffin sections were stained with Haematoxylin and eosin. Microscopic features were analyzed.*

*Results: Among 63 cases which showed endometrial metaplasias ciliated metaplasia was the commonest with 33 cases (52.38%), common age group was 40-49 yrs (46.02%).*

*Conclusion: In the present study ciliated metaplasia was the commonest and most commonly associated with simple endometrial hyperplasia. Hence hormonal stimuli are the main inducing factors for metaplasias.*

## INTRODUCTION

Metaplasia is a condition in which there is a change of one type of differentiated tissue into another type of similar differentiated tissue or as the abnormal transformation of an adult, fully differentiated tissue of one kind into a differentiated tissue of another kind.[1] The mullerian derived epithelium which lines most of the female genital tract is well known for its capacity to differentiate into various types of epithelium such as, ciliated, mucinous, endometrioid, transitional and squamous types.[2]

Endometrial metaplasias comprise a morphologically heterogenous group of proliferations and differentiations found in eutopic and ectopic endometrium involving epithelium and stroma. Epithelial endometrial metaplasias and reactive changes( EMC) are most frequent , while mesenchymal are uncommon. EMCs occur, mostly focally in surface and glandular epithelium , but in rare cases they can involve the whole endometrial cavity. Usually associated with physiological conditions such as menstruation and pregnancy, most occur in conjunction with pathological situations such as polyps, hyperplasia and adenocarcinoma. EMC s are rarely pure and often various histological types can be seen overlapping in the same specimen.Endometrial epithelial metaplasia is a group of non-neoplastic lesions, often coexisting with endometrial hyperplasia or adenocarcinoma.[3]

Hormonal or irritative stimuli are the main inducing factors, although some have a mutational origin.Endometrial metaplasias vary from reactive degenerative lesions to those associated with malignancy or having a preneoplastic potential.[3]

## MATERIALS AND METHODS

The prospective study was carried for a period of two years from August 2012 to August 2014 on endometrial curettings submitted to the Department Of Pathology by the Department of Obstetric&gynecology, JJM Medical College, Davangere, Karnataka. The processing of histopathological specimens was done as follows:

**Endometrial curettings:**

Endometrial curettings were processed as such. Fixation was done in 10% buffered formol saline.After tissue processing multiple 4-5mm thick paraffin sections were stained with haematoxylin and eosin. Microscopic features were analysed.[4]

## OBSERVATIONS

For the study group we assessed the following parameters: age, dominant clinical diagnosis, type of metaplasia and the histopathological report/diagnosis

Among 542 endometrial curettings in the study 63 (11.62%) were found showing different types of metaplasias.

Of 63 positive cases, maximum numbers of patients were in the age group of 40-49 yrsi.e. 29 (46.02%) cases followed by the next age group of 30-39 yrsi.e. 14 (22.22%) cases.Clubbing the two age groups together it was found that 146 (73%) cases were in the age group 30-49 yrs with the mean age of 39.5 yrs. The youngest patient in the study was 22 yrs old and the oldest was 69 yrs old. (Table 1)

| SI NO | AGE IN Yrs | NO OF CASES | PERCENTAGE(%) |
|---|---|---|---|
| 1 | 29 & below | 13 | 20.63 |
| 2 | 30-39 | 14 | 22.22 |
| 3 | 40-49 | 27 | 42.85 |
| 4 | 50-59 | 8 | 12.69 |
| 5 | 60 & above | 1 | 1.58 |
| | | 63 | 100 |

**Table 1. Showing the age distribution of cases**

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Common clinical diagnosis for which endometrial curetting was done included- DUB, endometrial hyperplasia, peimary infertility, retained products of conception, endometrial polyp,PID, CGH, suspected Carcinoma endometrium.

| SI NO | Clinical diagnosis | NO of cases | Percentage(%) |
|---|---|---|---|
| 1 | DUB | 33 | 52.38 |
| 2 | EH | 12 | 19.04 |
| 3 | PI | 5 | 7.93 |
| 4 | RPC | 4 | 6.34 |
| 5 | Endometrial polyp | 3 | 4.76 |
| 6 | PID | 2 | 3.17 |
| 7 | CGH | 2 | 3.17 |
| 8 | Ca endometrium | 2 | 3.17 |
| | Total | 63 | 100 |

**Table 2. Showing prevalence of clinical diagnosis in the study group**

Most common type of metaplasia was ciliated tubal metaplasia with 33 cases. The next common presentation was that of squamous metaplasia and hobnail cell metaplasia with 11 & 8 cases respectively. Next to follow was arias stellachange in 05 cases, eosinophilic cell change in 3 cases and the least common were morulas and mucinous metaplasia of the endometrium with 02 & 01 case respectively. Other rare forms of metaplasia like clear cell metaplasia, cartilaginous, osseous, glial and smooth muscle metaplasia were not seen in any of the cases.

| SI NO | Endometrial metaplasia | No of cases | Percentage(%) |
|---|---|---|---|
| 1 | Ciliated tubal metaplasia | 33 | 52.38 |
| 2 | Squamous metaplasia | 11 | 17.46 |
| 3 | Hobnail cell metaplasia | 8 | 12.69 |
| 4 | Arias stella change | 5 | 7.93 |
| 5 | Eosinophilic cell change | 3 | 4.76 |
| 6 | Morulas | 2 | 3.17 |
| 7 | Mucinous metaplasia | 1 | 1.58 |
| | Total | 163 | 100 |

**Table 3- showing the pattern and incidence of endometrial metaplasias**

The prevalence of endometrial metaplasia was highest in the age group of 40-49 for ciliated, and squamous metaplasias.

| SI NO | AGE | TUBAL | SQUAMOUS | HOBNAIL | ARIAS STELLA | EOSINO-PHILIC | MORULA | MUCINOUS |
|---|---|---|---|---|---|---|---|---|
| 1 | 29 & below | 3 | 2 | 4 | 3 | | | 1 |
| 2 | 30-39 | 9 | 2 | 1 | 1 | 1 | | |
| 3 | 40-49 | 14 | 7 | 2 | 1 | 2 | 1 | |
| 4 | 50-59 | 6 | | 1 | | | 1 | |
| 5 | 60 & above | 1 | | | | | | |

**Table 4-showing the prevalence of endometrial metaplasias in different age group**

**Discussion**

EMCs are observed in a variety of non-neoplastic and neoplastic conditions in all ages. EMCs and hyperplasia are not mutually exclusive lesions and they often coexist and overlap, since both are related to unopposed oestrogen stimuli.[5,6] Furthermore, EMCs have also been described in endometria of patients with progesterone-coated intrauterine devices,[7]and even associated with the new selective progesterone-receptor modulators.[8]As a rule, EMCs are frequently seen in endometrial polyps, endometriosis [9,10] and in the benign epithelial component of some tumors such as adenosarcomas.[11]Finally, they can occur indiverse conditions such as chronic inflammation, trauma andvitamin A deficiency.[12,13]

Ciliated endometrial epithelial cells are a normal phenomenon, so a diagnosis of ciliated metaplasia should be made only when one or more endometrial glands are lined predominantly by ciliated cells.[2]. In our study the relative incidence of tubal metaplasia was found to be 52.38%, which lies in close proximity with the studies of Hendrickson MR, Kempson RL 1980 found the relative incidence to be 58%. Out of which >50% were in the age group of 29-49yrs, which lies in close proximity with studies of Suzuko et al 2005. Most of the times these lesions are associated with endometrial hyperplasias[5]

Squamous metaplasia of the endometrium may be a focal finding involving glands or it may be widespread & involve most of the endometrium. Microscopically it is composed of bland squamous cells with eosinophilic cytoplasm. Morulas differ from mature squamous metaplasia in that they lack keratinization and intercellular bridges. Morules and foci and mature squamous metaplasia often co-exist. The present study found 11cases(17.46%) of squamous metaplasia of endometrium, in the age group of 29-49 yrswith 50% cases showing chronic granulomatous endometritis,rest 32% simple endometrial hyperplasia and 18% cases carcinoma endometrium and morules was seen in 2 cases(3.17%), whereas Suzuko et al found the relative incidence of same lesion to be 7% and M. Banyameen et al 2010 3%

Hobnail metaplasia may be seen as a reactive or reparative phenomenon (after a recent curettage), in pregnancy, arias stella reaction, progestin therapy. In present study the relative incidence of hobnail metaplasia is 12.69% with 50% patient below 29 yrs whereas in study by Hendrickson MR, Kempson RL 1980 the relative incidence was 6%.

Arias Stella change is almost always seen in pregnancy, trophoblastic diseases and occasionally with hormone therapy rarely there is no relation. The most important diagnostic dilemma is its differentiation from clear cell adenocarcinoma but the diagnosis of Arias Stella change is usually straightforward if there is a history of pregnancy or other morphological features of pregnancy are present. We in our study observed 5 cases (7.93%) of Arias stella change and 90% cases below 29yrs with h/o either placental site reaction, abortion, whereas the relative incidence of Arias stella change is 1% in study conducted by Suzuko et al and M. Banyameen et al 2010

Eosinophilic cell metaplasia is one of the common endometrial metaplasia occurring in both neoplastic and non neoplastic endometrium. It is characterized by the presence of epithelial cells with abundant eosinophilic cytoplasm. The cytoplasm may be granular in which case the term oncocytic metaplasia has be used[2]. eosinophilic cell changes was more frequently seen in endometrial hyperplasia and carcinoma than in non hyperplastic endometrium[14]. In the present study the relative incidence of eosino-

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philic cell change was 4.76% &> 50% cases were found in perimenopusal age group 40-49yrs having simple endometrial hyperplasia, whereas in study conducted by Suzuko et al 2005 and M. Banyameen et al 2010the relative incidence was 28% and 25.5% respectively.

Mucinous endometrial metaplasia should be reserved for cases in which the endometrial epithelial cells are replaced by cells with abundant mucin containing cytoplasm resembling endocervical cells. Normal endometrial epithelial cells contain some intracytoplasmicmucin, so abundant mucin is required for the diagnosis. Mucinous metaplasia may be seen in otherwise physiologic endometrium or in endometrial polyps.[2] Intestinal type mucinous metaplasia is extremely rare, rule out neoplasia when seen in biopsy[15]

In the present study only one case of mucinous metaplasia was found with relative incidence of 1.57%, aged 50 yrs with simple endometrial hyperplasia which is incordant with study conducted by Suzuko et al 2005 & M. Banyameen et al 2010 where the relative incidence was 26% & 25.5% respectively

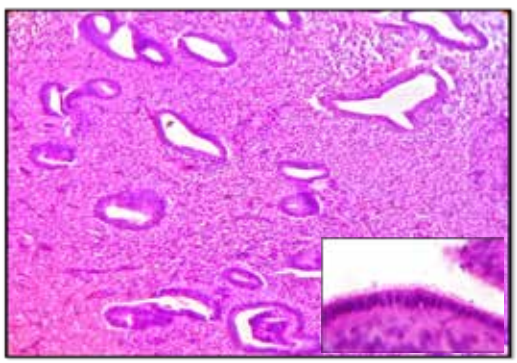

Fig 1.Simple endometrial hyperplasia with tubal metaplasia

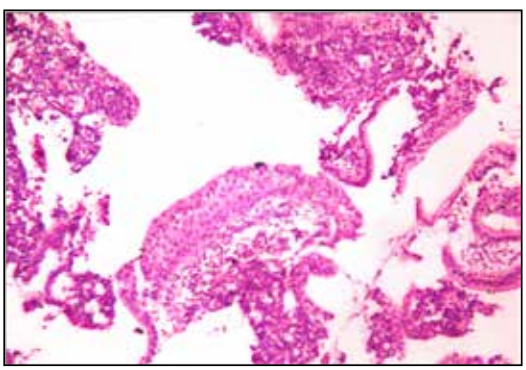

Fig 2.Squamous morules in irregular shedding/hormonal

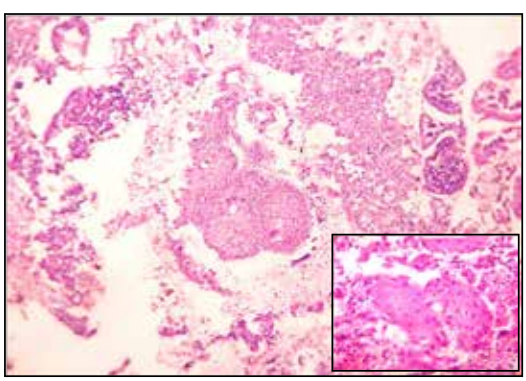

Fig 3.Squamous moreules in hyperplastic endometrium

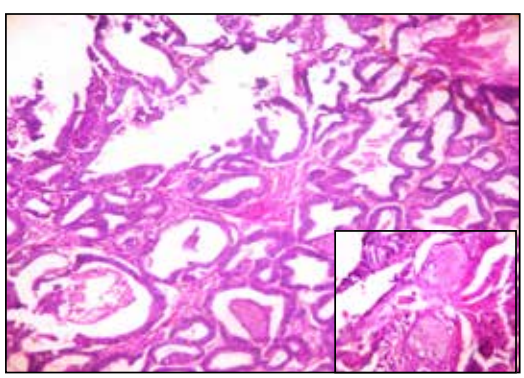

Fig 4.Squamous metaplasia in endometrial carcinoma

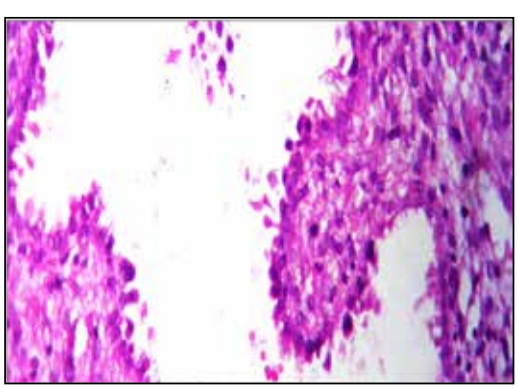

Fig 5.Hormonal response on hyperplastic endometrium showing hobnail cell metaplasia

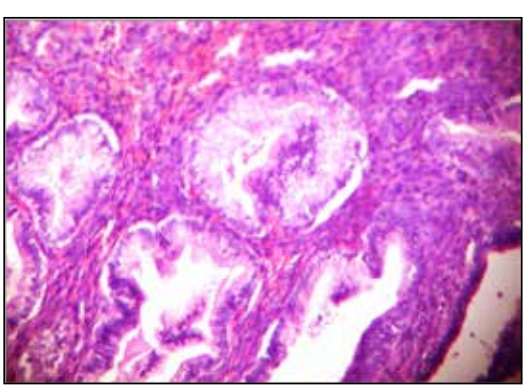

Fig 6.Mucinous metaplasia

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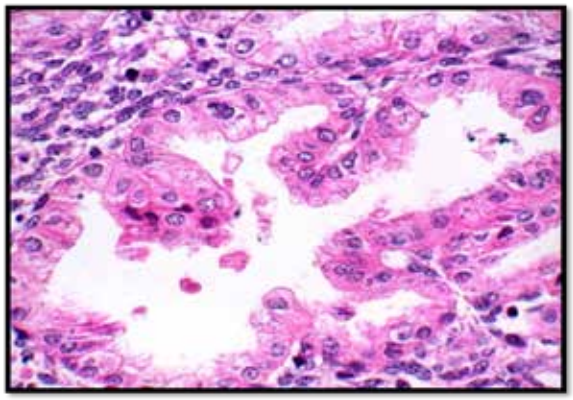

Fig 7.Arias stella change

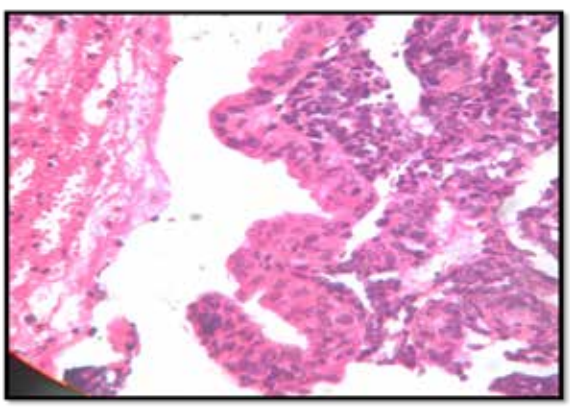

Fig 8.Endometrial stromal and glandular breakdown showing papillary syncytial metaplasia

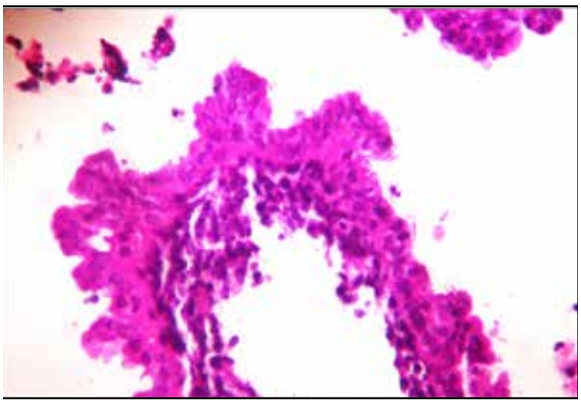

Fig 9.Endometrial stromal and glandular breakdown- eosinophilic cell change

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