

SPONTANEOUS GRANULOSA-CELL CARCINOMA IN A MOUSE AND ITS EFFECT ON THE FEMALE GENITAL TRACT

by

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Spontaneous tumours of the female genital tract are not common. Furth and Butterworth reported 57 ovarian tumours which they induced by exposing sexually mature female mice to x-ray irradiation. Geist et al, with a view to study the biological evolution of the functional ovarian tumours, sacrificed the mice at different spaced intervals of time after Roentgen irradiation. This had enabled them to confirm the relationship of granulosa cell tumour to thecoma and luteoma and fully evolved out fibroma and combination of these elements accounted for the theca granulosa cell and theca-luteomatous pictures not infrequently encountered in human material. In these mice oestrogen effects on the vaginal cells were observed. Enlargement of the uterine horns due to marked endometrial hyperplasia, again a morphological manifestation of oestrogen effect of the induced granulosa-theca cell tumours, was recorded. Presence of oestrin in blood of these animals with experimentally induced functional tumours of ovaries was

demonstrated and the hormone was also located in the tumour mass.

Recently Syamasundara Rao and Reddy, in a paper communicated for publication, described cystic hyperplasia of the endometrium, hyperplasia of cervical glands and extensive epidermadisation of both the glands and keratinisation of the cervical epithelium and carcinoma of the breast in mice treated with oestrogen injections. Identical changes were observed then in the female genital tract of a mouse with granulosa-cell carcinoma. Findings of the case are recorded below.

During the experimental study of induction of carcinoma of cervix by smegma potentiated with oestrogens and other co-carcinogens in our laboratories, we were fortunate to encounter in one of the saline-treated control mice a granulosa-cell carcinoma. Detailed autopsy study of this disclosed interesting changes in the female genital tract.

Mouse No. A404

Age of the mouse
at the time of death: 990 days.

Nature of experiment: 5 units of saline injected intravaginally by syringe once in 5 days.

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Autopsy and Histopathological Findings

A small ground-nut seed sized firm mass was felt in the right flank of the mouse. There was a small pin-head sized circumscribed whitish nodule over the posterior surface of the upper lobe of the left lung. Both the uterine horns were greatly enlarged and elongated—6 times the normal size (Fig. 1). The right ovary



Fig. 1.

Photograph of the dissected mouse showing the greatly enlarged and lengthened uterine horns due to cystoglandular hyperplasia.

was replaced by a solid pinkish yellow tumour mass. Its surface was smooth (Fig. 2). Sectioned surface showed cystic and haemorrhagic areas. Left ovary and other organs were nil remarkable.

Sections of the ovarian tumour showed typical morphological features of granulosa-cell carcinoma with cystic space. Some of the cells are arranged in trabeculated pattern (Fig. 3). Sections of the left ovary showed granulosa-cell proliferations.



Fig. 2.

Photograph illustrates the sectioned surface of the granulosa cell carcinoma of the ovary.



Fig. 3.

Photomicrograph illustrates the typical histological picture of granulosa cell carcinoma of the ovary (H & E x 110).

Sections of the left lung showed granulosa-cell carcinomatous deposit (Fig. 4). Marked cystoglandular

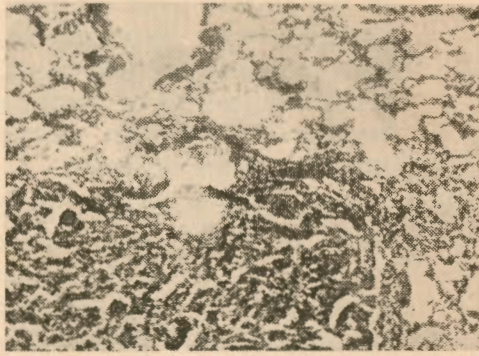


Fig. 4.
Photomicrograph illustrates granulosa cell carcinomatous infiltration of the lung. (H & E x 110).

hyperplasia of the endometrial glands (Fig. 5) and haemorrhage and



Fig. 5.
Photomicrograph illustrates cytoglandular hyperplasia of the endometrium. (H & E x 40).

haemosiderin pigment are seen in sections of the uterus.

Sections of the cervix showed epidermadisation of the surface epithelium and keratinisation of the

surface epithelium to over 50% of its width (Figs. 6 and 7). The glands of



Fig. 6.
Photomicrograph illustrates cystic dilatation and epidermadisation of the cervical glands. (H & E x 60).



Fig. 7.
Photomicrograph illustrates marked keratinisation of the surface epithelium of the cervix. (H & E x 60).

the cervix in addition showed hyperplasia, cystic dilatation and desquamation of the epithelium.

The changes depicted above in the genital tract of the female mouse with granulosa-cell carcinoma had been recorded by gynaecologists in the uncompensated oestrogen excess by way of hormone treatment or the human counter-part in granulosa-theca cell tumours of the ovary. All this information reminds the gynaecologist to explore all otherwise unaccountable persistent uterine bleeding either during the reproductive period or after climacteric, to exclude a lurking granulosa-theca cell tumour of the ovary. Routine necropsy study of laboratory animals may disclose the much discussed and disputed histogenesis of these tumours, i.e. from the ovarian stroma or from the follicular epithelium.

Summary

1. Spontaneous granulosa - cell carcinoma of ovary in a mouse

with pulmonary metastatic deposit is described.

2. Oestrogenic effect of tumour on the genital tract by way of cystoglandular hyperplasia of the endometrium and cervix, epidermadisation of both and keratinisation of the cervical epithelium are recorded.
3. A suggestion is made for the need to carry out routine necropsy study of all laboratory animals to spot the missing links in the pathology of some lesions.

References

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