Gynandroblastoma of the Ovary

BY

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ON the so-called germinal epithelium blastomata of the ovary many papers have already been published. Nevertheless, the study of these tumours may yield aspects which undoubtedly deserve special consideration. This is certainly true for the gynandroblastoma, which is a combination of granulosa-cell tumour and arrhenoblastoma. In the Gynaecological Clinic, Amsterdam, a growth of this kind was removed and examined.

Mrs. D. (Case No. 10767), 26 years of age, was admitted to the hospital on October 18th, 1937. Her main trouble was disturbance of menstruation. Until February 1935 the periods, which had begun at the age of 14, had been regular, with a cycle of 28 to 30 days and a duration of 5 days. In that year periods of amenorrhoea occurred, lasting 4 to 5 months and ending with a haemorrhage which was more severe and of a longer duration than a normal period. In June 1935 she had a continuous loss for 20 days. The last menstruation occurred in November 1936. Since February 1935 growth of hair has appeared on the face and the voice has become deeper. Sometimes she is troubled by flushing, and she thinks she has become more nervous than before. She is married, but she has never been pregnant.

On examination she was found to be well nourished. On the face there was a slight growth of moustache and beard, the mammae were well developed, and the hair on the abdomen was of a virile type. The voice was conspicuously deep. Signs of pregnancy were absent: there was not any colostrum, pigmentation, or lividity of the vaginal mucosa. The clitoris and vagina were normal. The body of the uterus was in anteflexion, it was normal in size and consistence, and was somewhat displaced to the right by a rather firm lump in the left half of the pelvis.

The patient was operated upon on October 21st. The left ovary presented as a solid growth the size of a large tangerine orange. The right ovary was normal. The growth was removed with the lateral portion of the left Fallopian tube, and the appendix was removed.

The post-operative course was undisturbed, and the patient was discharged on November 4th in a good condition. On December 3rd she attended for examination and reported that she had menstruated normally from November 21st to 26th. The amount of hair on the face had diminished, but on the abdomen it was still unchanged; the voice was still deep. On examination no other abnormal condition was found in the pelvis.

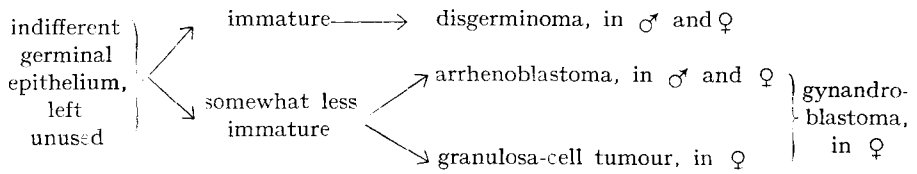
The ovarian tumour was yellow on section. The largest part was occupied by a cavity filled with a coagulated mass of a clear yellow colour. On the other pole a structure the size of a cherry was found which resembles a corpus luteum. Between the cavity and this portion there were islets of tissue of an intense yellow colour. Fig. 1 is a diagram of the appearance of the growth, in which, in addition, the parts which have been sectioned for microscopy are indicated. In section I, in a slightly oedematous stroma, strands and islets of cells are seen having the appearance of granulosa cells. In the islets in many places a folliculoid structure can be strikingly seen (Fig. 2). Section II shows a preponderance of the adenoma picture: tubules coated with a low cylindrical epithelium (Fig. 3). The cavity is coated with a layer of cells resembling granulosa cells, and in its neighbourhood strands of the same cells are seen. The solid strands merge gradually into the tubules (Fig. 4). Section III shows both constituents of the tumour along with each other. In Fig. 5 one sees above a *moiré* pattern typical for granulosa-cell tumour, and below the tubules characteristic of arrhenoblastoma. The adenomatous portion corresponds with the patches of an intense yellow colour seen macroscopically on the cutting surface.

In the growth elements of granulosa-cell tumour and of arrhenoblastoma were found. In Fig. 5 these components are seen completely separated from each other, but in Fig. 4 a gradual transition is visible. The qualification of gynandroblastoma is, therefore, justified. In this case one can expect symptoms characteristic for granulosa-cell tumour or for arrhenoblastoma, which will depend on which of the components preponderates in hormonal action. The history and signs of this

patient made one expect an arrhenoblastoma, the deep voice and the growth of hair on the face and abdomen pointing in this direction. These signs are certainly not compatible with a granulosa-cell tumour. Amenorrhoea may occur in the presence of either kind of tumour, in the case of arrhenoblastoma being a sign of defeminization, whereas in granulosa-cell tumour it is caused either by excessive production of folliculin (with hyperplasia of the uterine mucosa and temporary amenorrhoea, alternating with haemorrhages), or by luteinization of the tumour (causing pseudo-pregnancy). The restoration of the menstrual function after the removal of the tumour shows clearly that the phenomenon was caused by the tumour. We were interested to know the condition of the endometrium and, therefore, removed some tissue from the cavum uteri with a suction curette on October 20th and 28th. The material of the first removal, unfortunately, was not sufficient for microscopical examination; that of October 28th showed an almost normal mucous membrane with a few ectatic glands, certainly not deserving the name of typical hyperplasia.

So far as we could find in the literature on blastoma of the germinal epithelium, 12 gynandroblastomata have been described, viz.: by Meyer,[1] Tietze,[2] Amati,[3] Schiller,[4] Eerland and Vos,[5] and Frankl.[6] Nine out of these 12 patients were in the period of active sexual function, the other three (Tietze's cases) were at the menopause. Kehrer[7] mentions gynandroblastoma and observes that it is still hypothetical. Descriptions of this kind of tumour can be found in papers on arrhenoblastoma and in those on so-called masculinizing granulosa-cell tumours. In our opinion a pure granulosa-cell tumour cannot cause masculinization. The neoplasms known as luteinized granulosa-cell tumours with virilism are hypernephromata, as Schiller[8] has clearly shown. The other granulosa-cell tumours with signs of masculinization must contain elements belonging to arrhenoblastoma, and are, therefore, gynandroblastomata.

The histogenesis of the blastomata of the germinal epithelium is indicated by the following diagram:—



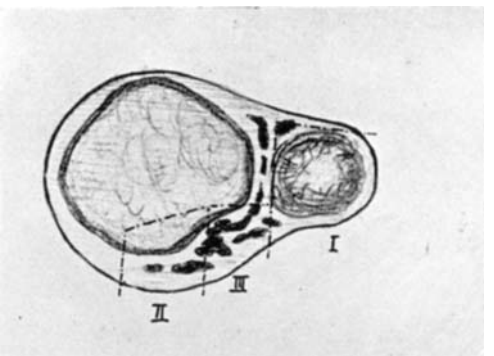


FIG. 1.
Diagram of tumour in section.

FIG. 2. SECTION I.
Folliculoid structure of tumour.

FIG. 3. SECTION II.
Adenomatous structure of tumour.

FIG. 4. SECTION II.

Above, to the right: cavity, coated with granulosa cells; below this strands of these cells. Middle: tubules.

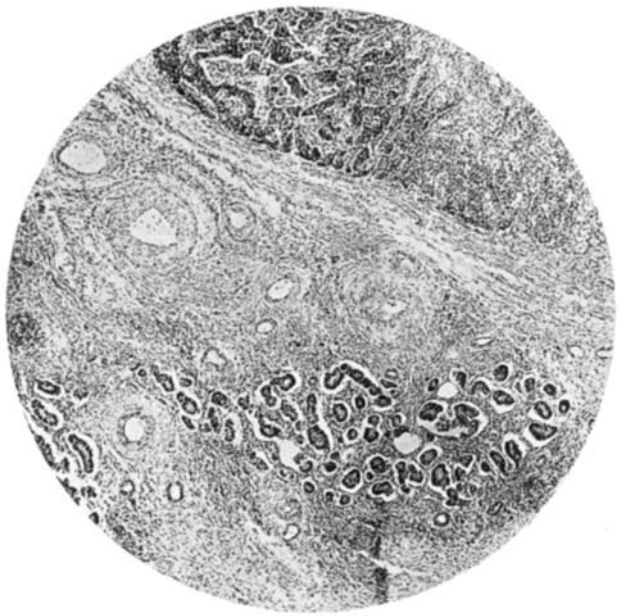


FIG. 5. SECTION III.

Above: "moiré" pattern. Below: tubules.

Arrhenoblastoma and granulosa-cell tumours arise from epithelium of the same degree of maturation, and it is not illogical that elements of both kinds of tumours should occur together in one growth, the gynandroblastoma; the indifferent germinal epithelium develops partly in the male and partly in the female direction. Amati, in his tumour, found, side-to-side with adenomatous portions (arrhenoblastoma) and parts resembling Graafian follicles (granulosa-cell tumour), also elements which he thinks justified his calling large-cell carcinoma (disgerminoma). This would be the first case of blastoma of the germinal epithelium containing all three elements.

The gynandroblastoma, as the other blastomata of the germinal epithelium, can show malignant degeneration. Meyer, in his case, assumes the diagnosis of carcinoma on the microscopical appearance; Eerland and Vos are in doubt whether their third case is malignant. Undoubtedly malignant is the first case of Schiller, as has been proved later by Hückel.[9] In our case the histological picture is benign.

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