

THE ROLE OF OVARIAN DISEASE IN THE PRODUCTION
OF STERILITY.*

A PRELIMINARY CONTRIBUTION.

By GEO. W. KOSMAK, M.D.,
Attending Surgeon.

Notwithstanding the attention which has always been accorded to the relief of sterility in women, we must still acknowledge our great ignorance as to many of the features in connection with the physiology, pathology and treatment of this condition. Numerous methods of an operative character have been proposed to overcome the failure to conceive in women and one must regretfully acknowledge that their shortcomings are numerous. Aside from the necessity of always studying the husband's condition, arises the need for a careful examination of the wife and close attention to every lesion which might serve as a morbid factor. Malformations and malpositions of the generative tract undoubtedly occupy a very important place in the production of sterility although it is probable that their effect has been overestimated. It is hardly possible that even a stenosed cervical canal can offer any obstruction to the progress of a spermatozoon which in its largest dimensions must necessarily be very much smaller than even the most tightly contracted cervical tube. It is more likely that circulatory and other disturbances which attend these malpositions are the direct preventatives of conception, a subject which we need not discuss further in connection with this paper. Of ovulation, in respect to the time at which it takes place in relation to the menstrual periods, we are still more or less in ignorance and whether each menstrual period is necessarily accompanied by the discharge of an ovum cannot be stated conclusively. We presume that a Graafian follicle ruptures at each menstrual period but whether this occurs in each ovary alternately has not as yet been demonstrated. Nor do we know whether successive Graafian follicles ripen and rupture

*Read at the Annual Meeting of the State Medical Society. Rochester, N. Y. April 30, 1913.

during successive months in a healthy ovary when the other is diseased. The only presumptive evidence which we have pointing to this fact is that in the presence of a cystic ovary which does not functionate, menstruation and apparently ovulation, go on regularly. I have been impressed with the idea that although the menstrual function is apparently not inhibited in such cases, a Graafian follicle with its contained ovum does not always rupture on each occasion, for in many instances where such disease of the ovary is present sterility is a frequent accompaniment. This is a situation which it has been my endeavor to examine for proof with the aid of statistics obtained from various observers. For the purpose I distributed to a selected list of about 300 physicians, a questionnaire containing the following requests for information:

Patient's name, age, etc.

Married how long before oophorectomy was performed?

Number of children before oophorectomy and their sex?

Indications for operation?

Which ovary removed?

Pathological condition of the same.

Any other operation done at the same time?

Character of first menstrual period subsequent to oophorectomy.

Date of birth of children after oophorectomy.

Sex of subsequent children.

Unfortunately the results have not been entirely to my satisfaction as only a comparatively few responses were secured and in most instances the data were not sufficiently explicit to permit the drawing of any definite conclusions. I hope to continue the investigation, however, and at some future time to be in a position to obtain more definite results.

The question of sterility in women is such an important one that we ought to take every factor into consideration which may have a bearing on the situation. The masterly papers published by Edward Reynolds of Boston, Clark and Norris of Philadelphia, and others, clearly demonstrate this fact and I have been largely impressed and influenced by their statements. The principles of conservative treatment of the ovaries in laparotomies is of undoubted value as we know the functioning power of even small masses of ovarian tissue is not to be questioned. We ought to differentiate, however, the particular lesion present in the ovary in our cases, as ovaries damaged by inflammatory processes with the production of adhesions would seem much more amenable to treatment than those in which a cystic degeneration has occurred. From a study of such cases as the example detailed below, I have been led to believe that marked cystic degeneration of the ovaries is the central and important factor in the production of the sterility in certain instances, for reasons which I am not at present competent to state. I hope, however, to bring forward more definite evidence in the future. The limits imposed upon me in the reading of this paper will prevent any extended statement of the literature of the subject although this is not very exten-

sive in this particular field. Let me relate briefly a case in which a cystic ovary with resultant symptoms was probably the cause of a sterility in a patient in whom no other definite lesion could be demonstrated.

Mrs. L., was first seen by me on February 22, 1912. She was then thirty-six years of age and had been married seven years. She had never been pregnant and a dilatation with curetage was done four years previously for dysmenorrhea and sterility. Her menstruation was regular, scant and somewhat painful although less so than before her operation. Two years previously she had an attack of pain in the right iliac fossa which lasted for two days. Otherwise the patient was in good health and accustomed to considerable out-door exercise. She was a well nourished woman and not inclined to any neurasthenic symptoms. Four weeks previous to the time I saw her she began to complain of pelvic distress. When examined at the time of my first visit, the right ovary was sensitive and tender, the tube likewise. The left side seemed normal. She had been in bed more or less during the last period but did not secure entire relief. There had been no omission of any periods and there was no flow between the periods, neither was there any rise in temperature or pulse rate. The patient also complained of a desire to urinate frequently. A more careful examination undertaken about two weeks later showed an anteflexed and anteverted uterus, movable and not tender. Posteriorly and apparently attached to the uterus was a rounded mass as large as a hen's egg and tender to the touch. The cervix appeared congested and the os small. In view of the scant and somewhat painful periods and the presence of the mass in the pelvis which was taken to be an enlarged ovary, operation was advised and consented to. On March 20, 1912 at the Lying-In Hospital a laparotomy was done after preliminary dilatation and curetage. Exploration of the cervical canal showed that the calibre of the same was so contracted as to admit only a fine silver probe. After cureting the uterine cavity a hard rubber stem pessary was introduced and left in situ. After opening the abdomen exploration of the pelvis showed a uterus of normal size, with normal tubes that were patent to the passage of a probe. On the left side the ovary was as large as a pigeon's egg, cystic in character and attached by moderately strong adhesions to the sigmoid and part of the cul-de-sac of Douglas. This left ovary did not seem to contain any normal tissue and was completely excised, especially as the right ovary was apparently of normal size and character. The appendix presented a marked constriction about half inch away from the tip, and was removed. The patient made a good recovery and on April eighth, nine days after operation had a free discharge of blood which lasted about twenty-four hours and simulated a period. On April twentieth the stem pessary was removed. On April twenty-eighth a period came on which lasted five days, was more profuse than usual and free from pain. The patient stated that it came on nine days ahead of the expected time. Following the same she had normal periods on May twenty-second and June fifteenth, each lasting

about four days. The patient became pregnant, went through a perfectly normal pregnancy and was delivered on March thirtieth, 1913, of a full term healthy girl baby after a moderately severe labor. Dilating bags had been introduced the day previously as the patient had irregular pains but showed no tendency to go into labor and the child seemed to be at term.

This is an instance where the relief from the sterility might be ascribed to the dilatation and curetage but as this had been done on a previous occasion without results it is improbable that it was not the only factor. Undoubtedly the presence of cystic ovary without traces of Graafian follicles or corpora lutea showed that the functioning power of the left ovary was either gone or very much reduced and that the chances for impregnation were actually reduced one half by this fact. Why should the removal of such an ovary tend to do away with a sterility? This is a difficult question to answer yet we may assume that the irritation and disturbance produced by the presence of a diseased ovary of this character would in itself act as a bar to successful fertilization. It would be considered very radical to advocate the removal of a cystic ovary in all such cases, however, particularly if the enlargement was not of a marked degree and likewise if instead of a cystic ovary we are dealing with adnexal tissues that are the seat of inflammatory processes. Yet it might appear advisable to do this if children were desired and this lesion on the part of the mother was discovered to be the only obstruction to pregnancy. While such ovarian disease may not be the only cause in the individual case it undoubtedly constitutes a contributing factor and may possibly be of greater moment than abnormalities in position etc., of the uterus and cervix.

Another point of interest is in the reference to the influence of one diseased ovary on the other. We often find that the removal of such tends not only to the relief of specific symptoms referable to the same but also to an apparently increased function on the other side. In nineteen cases out of a series collected, pregnancy had not preceded the operation of oophorectomy and with the exception of three in which an ectopic was present, cystic ovaries or a chronic salpingo-oophoritis was given as the cause for the removal. An attempt to determine the character of menstruation after the operation was unsatisfactory in most cases although in several operated on by the writer a relief from the pelvic distress and an improvement in the menstrual conditions was clearly evident.

The writer is fully aware that the series of forty-five cases which he has been able to collect from various operators is entirely unsatisfactory as regards the conclusions to be drawn from the same. In collecting them he was desirous of obtaining information not only as regards the relief of sterility but also on the effect of the removal of one ovary on the sex of the child. The present communication is presented as a preliminary paper because it is hoped that in a few years more definite records

of a larger number of cases will be secured. The results are, therefore, presented for what they are worth. There were seven cases of extra-uterine pregnancy in the series in which the ovary was removed in connection with the ruptured tube, otherwise the ordinary cystic degeneration served as the reason for the oophorectomy except in a few instances where salpingo-oophorectomy with adhesions was given as the cause. In nine cases a uterine suspensory operation was done and likewise an appendectomy. In twenty cases children were born previous to the removal of the ovary. As regards the sex of children born subsequently, attention may be called to the fact that the sex changed in four cases and remained unchanged in seven where children of one sex had been born previously. In three cases with more than two previous children of different sexes, the sex after oophorectomy followed the preponderating sex previously. In one case where five female children had been born there were two males and one female in the succeeding births and in another where four females were born a male subsequently resulted. An attempt to relate the sex to the removal of one or the other ovary was therefore unsuccessful, as in the series of forty-five cases there were sixteen male and thirteen female infants following the removal of the right ovary and sixteen male and fifteen female infants following the removal of the left ovary—a fairly equal division of the sexes.

In the nineteen cases of the series in which pregnancy had not preceded the operation the oophorectomy was done in three women, while still single and in seven in a year or less after marriage. In the remainder the operation was done in from four to ten years after marriage. In three cases pregnancy took place in less than a year, in ten cases in less than two years and in three cases between five and six years, although several abortions occurred in one of the latter series. As regards the sex of these children we find that in cases where the left ovary was removed there were eight males and nine females subsequently born and where the right was removed there were five males and eight females.

SUMMARY.

There seems to be no question from the observations thus far made by a number of writers, that the question of sterility in an otherwise healthy woman must depend on an aggregation of factors rather than on a single lesion and that in every instance the entire pelvic contents must be subjected to careful study.

In a certain proportion of cases, however, the removal of an ovary which is diseased undoubtedly contributes to increased function in the other, as evidenced by an improvement in the menstrual conditions and the greater possibility of subsequent pregnancies.

It would appear as if the question of sex was not dependent on the side from which the individual ovum is derived and that whether the left or right ovary is removed the proportion of sexes in subsequent children is about equal.

The following tables are based on details of cases received in reply to the questionnaire previously referred to.

TABLE I. CASES STERILE BEFORE OOPHORECTOMY.

No.	Years married before ooph.	Indications for operation	Ovary removed	Time of subsequent pregnancy	Number and sex	
3	1 year	Ectopic	Right	2 years	3 females	Several abortions
5	6 months	Cystic	Left	1½ years	female	
11	1 year	Cystic	Right	5 years	female	
13	1½ months	Cystic	Left	1 year	1 male 2 females	
16	6 months	Ectopic & cyst	Right	2 years	male	
17	3 months	Cystic	Left	1½ year	female	
18	3 years		Right	1 month	male	
19	5½ years	Ectopic	Left		2 females	
21	4 yrs. before	Cyst	Right		2 females	
22	6 years	Cyst	Right	2 years	2 females	
23		Cyst	Right	2 years	2 males	
24	5 months	Cyst	Left	6 years	2 males	
25		Cyst	Left	5 years	1 male 1 female	
30	4 years	Cyst	Left		3 males 2 females	
31	1½ years	Cyst	Right	1½ years	male	
34	4 years	Dermoid	Right	1 year		
42	Unmarried	Cyst	Left	2 years	1 male 1 female	
43	10 years	Salp-ooph.	Left	7 months		
45	7 years	Cyst	Left	2 months		

TABLE II. SEX AFTER OOPHORECTOMY.

Ovary removed indicated by

No.	Right ovary removed	Left ovary removed	No.	Right ovary removed	Left ovary removed
1	.....	Male	24	Males II	
2	Males II		25	Male I, Female I	
3	.....	Females III	26	.....	Male
4	.....	Female	27	?	Females II
5	Female		28	?	
6	.....	Male	29	Male	
7	.....	Female	30	Male II, Female III	
8	.....	Male	31	.....	Male
9	.....	Male	32	Male	
10	.....	Female	33	.....	Male
11	.....	Female	34	.....	?
12	.....	Male I, Female I	35	.....	Male
13	Male I, Female II, III		36	Female	
14	Male		37	Male	
15	.....	Female I, Male II	38	Male	
16	.....	Male	39	?	
17	Female		40	.....	Male
18	.....	Male	41	Male	
19	Female		42	Male I, Female I	
20	Female		43	Male	
21	.....	Females II	44	Male	
22	.....	Females II	45	Female	
23	.....	Males II			

SUMMARY: Male infants, 16
Female * 13

Male infants, ... 16
Female * ... 15

TABLE III. SEX OF CHILDREN PREVIOUS TO OOPHORECTOMY.

Case No.	Previous sex and number	Subsequent sex and number	Ovary removed
1	Female (1)	Male (1)	Left
2	Female (1)	Males (2)	Left
4	Females (2)	Female (1)	Right
6	Male (1)	Male (1)	Right
7	Female (1)	Female (1)	Right
8	Female (1)	Male (1)	Right
9	Male (1)	Male (1)	Right
10	Female (1)	Female (1)	Right
12	Female (1)	Male (1) Female (1)	Right
14	Males (2) Female (1)	Male	Left
15	Females (5)	Female (1) Males (2)	Right
20	Female (1)	Female (1)	Left
26	Female (1)	Male (1)	Right
29	Males (2) Female (1)	Male (1)	Left
32	Females (4)	Male (1)	Left
33	Females (2)	Male (1)	Right
35	Female (1) Male (3)	Male (1)	Right
36	Male (1)	Female (1)	Left
41	Males (7)	Male (1)	Left
44	Female (1) Male (1)	Male (1)	Left

Total cases 20 with children previous to oophorectomy.

Sex changed, 4

Sex unchanged, 7

In three cases with more than two previous children both male and female, the sex followed preponderating sex.

One case with 1 of each sex, next child, male, (left ovary removed)

Two cases " 2 males and 1 female, next child, male, (left ovary ")

One case " 3 " " 1 " next child, male, (right " ")

" " " 5 females, 2 males and 1 female, (right " ")

" " " 4 " 1 male, (left " ")

=