

Intrauterine Instrument X

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A Study on the Birth Control with an Intrauterine Instrument

By

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Part I. Animal Experiment

The study as to whether the intrauterine foreign substance will prevent pregnancy or not has been neglected until *Graefenberg* (1928-1931) publishes his reports on the contraception with silk and silver ring in the uterus. It attracted the notice of only in a few cases. The sterility in a case of uterine myoma was considered to be caused by the foreign action of the myomatous nodule. *Bertelsmann* (1896) recognized a swelling of muscular fibres around the myomatous nodule and said it would originate from the movement of the uterine muscle to remove the foreign bodies. *Uchigaki* (1928) caused a sterility by implanting a cartilageous bone on the uterine wall of rabbit. Inferring from that a polypus of cervical mucosa caused a sterility, *Kochs* (1902) attempted to cause a sterility by forming a small piece of mucous membrane on each of the anterior and the posterior surface of the cervical region. But all these were not the perfect satisfactory studies. The contraception with the intrauterine foreign bodies had attracted greatly the clinical interest since *Graefenberg* published his view. The re-examinations, critics, and animal experiments were tried by *Lehfeld* (1928), *Retschmensky*, *Haire* (1930, 1931), *Leunbach* (1931), *Carleton & Phelps* (1933) and others, and discussions arose on the cause of the sterility due to the foreign substance in the uterus.

Graefenberg imputed the disturbance in the embedding of an impregnated ovum to the swelling of uterine mucosa owing to the intrauterine substance and imagined the swelling would owed

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to the chemical action of silver used for the instrument. *Ret-schmensky*, to the change in the hydrogen-ion concentration of the mucosal secretions. *Carleton & Phelps* regarded as the cause of sterility the necrosis of tissues and the atrophy of glands which originated from the intrauterine instrument. Thus no agreement was obtained among the advocates. A few years ago I began the study with the contraceptive instrument put in the uterus and performed an experimental research into the cause of sterility.

A metallic spiral ring was inserted as a foreign body in one region of a rabbit uterus and was tied to the uterine wall with a silk thread to prevent from falling out. An experiment on pregnancy was tried. Within a week after insertion pregnancy did not take place in the uterine cornu where the instrument was present. After the lapse of 20 days, the occurrence of pregnancy was hindered only in the region where the substance existed, but was possible in the other parts. This phenomenon was irrespective of the materials of the instruments, gold, silver, silver plated with gold and brass plated with gold, etc. and the same result was obtained in any case.

Fig. 1.

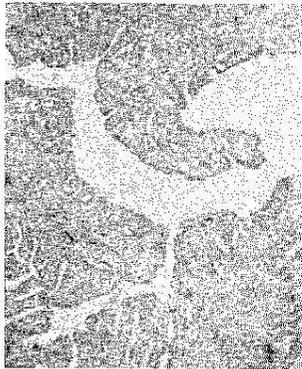


Fig. 2.



The instrument had been standing in the parts pointed by sagittal marks.

The premature delivery and abortion were hardly caused by the instrument. The changes of the uterine mucous membrane due to the presence of the instrument were not generally marked. No inflammative findings were found. In general the swelling of mucous membrane and the proliferation of glands did not take place, though the swelling was caused in some cases that the instrument was left for a long time. No necrosis was caused by the pressure of the inserted substance and the atrophy of glands also were not marked (vide Figs. 1 and 2).

It may be proper to imagine that the reason why the foreign body checks impregnation, consists in the mechanical or the physico-chemical actions, but the minute mechanisms of the actions are not yet made perfectly clear.

Part II. Clinical Experiment

From olden times it had been tried to cause a contraception by some instruments in the uterine cervix among the people, but the instruments which were inserted deep into the uterine cavity to check the embedding of ovum appeared in the latter half period of the preceding century. Such instruments, however, gave a rise to dangers and were low in the efficacy, so that no consideration was given to them from the medical point of view. As for the changes numerous such cases were reported by the researchers and this has been excluded from consideration and no special technical improvements have been attempted. It was *Pust* (1923) who first noticed the contraceptive efficacy of the intrauterine substance and tried some improvements of the instruments used among the people. He made a bundle of silk by taking into consideration that the instruments used among the people had the danger of causing injuries, perforations and bacterial infection in the uterine wall like the so-called contraceptive-pin. *Graefenberg* further improved the instrument by removing some portions of *Pust's*, which stood outside the uterus.

With these points in view I too had began a study of the

intrauterine instrument of contraception. Hinted by *Graefenberg's* silver ring I carried out a re-examination with a golden ring, then tried some improvements and reported some of the results on the 26th meeting of the Kinki Gynecologic Society in Sept., 1932. Since then some more cases had been experimented and I could believe in the efficacy of my improved one from the clinical results as well as the experiments on the animals in the former Part.

Fig. 3.

Presear-ring

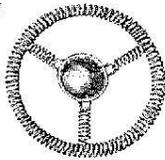
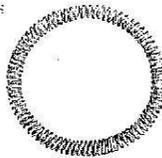


Fig. 4.

Graefenberg's
ring

The "presear-ring" of my design is improved from *Graefenberg's*. It has a vacant flat ball in its center and the ball is connected with the ring. The ordinary size is 18 mm in diameter and the size is varied according to the width and shape of uterine cavity. One circle of the ring coil is 2.3 mm in diameter and the ring's wire, 0.3 mm in diameter. The ball is 7-9 mm in diameter, 4 mm in thickness and about 1.0 gm in weight.

Fig. 5.

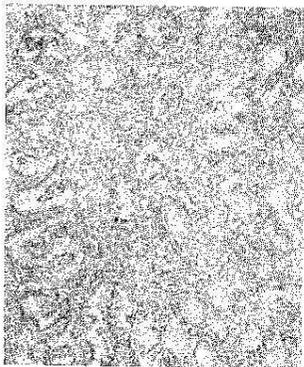
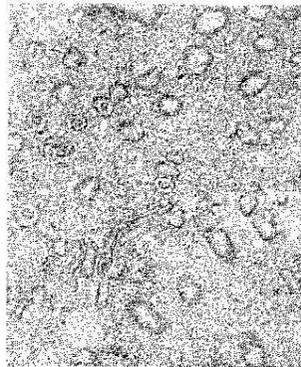


Fig. 6.



The comparison of my "presear-ring" and *Graefenberg's* proved that the former is far superior to the latter. With the latter instrument pregnancy took place in 5 cases out of 51, while with the former it failed only in 1 out of 73 cases. I am sure the success of 100% will be gained by some more improvements.

My ring was great in its surface expansion as an intrauterine foreign substance and the flat ball in the center was hardly go into the uterine mucosa, so that the efficacy for the purpose was great. The mechanism of the intrauterine substance to prevent pregnancy is yet unknown, but an agreement was obtained in the point that the efficacy increased with the enlarging of the instrument's surface.

The disturbances due to the installment of the ring were out of question. The insertion was so easy, that it could be practicable in the out-patients.

The uterine mucosa showed the proliferation of glands in some cases as shown in Figs. 5 and 6, but generally speaking underwent no marked changes and never any inflammative one.

After the removal of the ring pregnancy was possible, so that this method is worthy of practising for the temporary contraception.

The ring was made of gold, or silver plated with gold. Silver is liable to undergo some change, but if plated with gold the plated gold never went away even after allowed to stand in the uterus for 2 years.

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