PERFECTION OF THE TECHNIQUE AND APPARATUS
OF HYSTEROSALPINGOGRAPHY

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In recent years hysterosalpingography has found increasing use in the gynecological clinic. The visualization of the method and the possibility of diagnosing pathological changes of the oviducts and uterus by means of it broaden the indications for its use.

The development of hysterosalpingography proceeded along three main directions: 1) search for improved contrast media, 2) improvement of the technique, and 3) creation of improved apparatus.

Prior to 1924 such preparations as Lugd’s solution, bismuth paste, and sodium bromide were used for hysterosalpinography [1-4]; after 1924 iodized oils became popular [5-8]. However, despite the good results (clear contrasting roentgenograms) adverse features in using these contrast media were soon found: entry into the blood vessels and subsequent pulmonary embolism, slow resorption by tissues, and possibility of the occurrence of an inflammatory process.

The new stage in the development of hysterosalpingography began after 1933 in connection with the use of water-soluble preparations as contrast media [9-12]. Good degree of contrast, rapid absorbability, and ability to be excreted from the body readily, absence of irritation of tissues, low viscosity, safety—all these advantageously distinguished water-soluble preparations. The technique of hysterosalpingography also changed along with improvement of the contrast media. Thus, whereas both the open and closed method of hysterosalpingography were used earlier, now only the closed method is used, in which the ostium uteri is closed tightly, as a result of which the contrast medium does not flow out into the vagina. This is especially important when using water-soluble contrast media.

In the roentgenological department of the All-Union Scientific Research-Institute of Obstetrics and Gynecology (VNIiAG), where between 800 and 1000 hysterosalpingographies are performed yearly, its technique has been improved continuously over the past 10 years. A cannula of the Shul’ts type, modified by doctors of the department, was used as the instrument for hysterosalpingography. A technique of hysterosalpingography was developed which in the majority of cases permitted establishing the correct diagnosis. This technique consists of the following.

Hysterosalpingography is performed on the x-ray apparatus for urological investigations (universal roentgeno-urological table, model 2M70). The patient lies down on the edge of the table in a position for vaginal operations. After treating the external genitalia with a solution of chloramine a bimanual gynecological examination is made. Spoon-shaped specula are inserted into the vagina. Its walls are treated with a cotton ball, at first dry, and then soaked with alcohol. The labium anterius ostii uteri is grasped with bullet forceps. In so doing they are applied on the outer surface of the labium anterius ostii uteri without puncturing the interoceptor-rich mucosa of the cervical canal, better tangentially, i.e., in a transverse direction.

It should be noted that the use of two or three bullet forceps for closing the cervical canal with the use of the nozzle from a Braun syringe causes spasm of the tubouterine sphincters in a considerable
Fig. 1. Modified Shul'ts cannula used for hysterosalpingography. 1) Conical cannula; 2) "rider".

Fig. 2. Remote-control attachment for introducing the contrast medium into the uterine cavity.

percentage of investigations. The instrument, which is a slight modification of the Shul'ts cannula (Fig. 1), is filled with the contrast medium heated to body temperature. After treating the ostium uteri with alcohol (treatment of the cervical canal and preliminary probing of the uterus are not performed in order to avoid trauma of its mucosa) the tip of the instrument, equipped with a rubber conical cannula (Fig. 1), which closes the ostium uteri well, is inserted into the cervical canal. The branches of the bullet forceps are mounted at an appropriate distance on a "rider" which is fastened on the instrument by a screw (Fig. 1, 2). After checking the tightness of closing the ostium uteri by introducing a small amount of contrast medium into the uterine cavity, the vaginal specula are removed, and the patient is placed on the table so that the central x-ray passes through the upper edge of the symphysis pubis.

When using water-soluble contrast media the photographs must be taken at the moment of introducing the contrast medium into the uterine cavity. Therefore, to protect the doctor against x-ray radiation, a movable lead shield protecting additionally the trunk and legs of the doctor is used along with a special apron attached on the x-ray apparatus for urological investigations. While taking the x-ray photographs the uterus, by pulling the bullet forceps toward oneself, upward or downward, is placed in a surface position so as to attain the correct image of the uterine cavity. For taking the first photograph 2-2.5 ml of contrast medium is introduced in order to obtain a relief image of the uterine cavity. After processing and examining the first photograph an additional 3-4 ml of contrast medium is introduced, and the second photograph is taken. In so doing a tighter filling of the uterine cavity is obtained and the contrast medium usually enters the tubes and abdominal cavity. After examining the second photograph a third is taken if necessary. Usually from 10 to 20 ml of contrast medium are needed for the entire procedure.

It should be noted that, depending on the purpose of the investigation and conjectural diagnosis, hysterosalpingography should be done on different days of the menstrual cycle. Thus, for determining the patency of the oviducts it is better to perform hysterosalpingography in the second phase of the menstrual cycle, whereas in the case of suspecting adenomyosis, this procedure should be done on the 7-8th day of the menstrual cycle when the shed functional layer of the uterine mucosa does not interfere with penetration of the contrast medium into the endometrioid passages. In the case of suspecting submucosal myoma of the uterus, hysterosalpingography can be performed in any phase of the menstrual cycle.

Hysterosalpingography is presently carried out in the roentgenological department of VNIIAG on the TIR-10001 x-ray apparatus with an image-converter tube.

So that the doctor can be outside the zone of action of the x-rays, co-workers of the department proposed a device (Fig. 2) permitting introduction of the contrast medium into the uterine cavity from a distance (N. M. Pobedinski, A. I. Volobuev, M. I. Legat).

This is done in the following way. The syringe together with the cannula for hysterosalpingography is fastened on a stand with a heavy metal base. The branches of the bullet forceps applied on the labium anterius ostii uteri and fixed by means of the "rider" are fastened on the stand by a metal hook, which makes possible, by moving the attachment away from the patient, bringing the uterus into the necessary position relative to the table. The plunger of the syringe is actuated by means of a flexible cable about 2 m long fastened on the stand, which allows the doctor to move away from the x-ray apparatus, behind the shield.