CERVIX RETAINING INJECTION NOZZLE

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Fig. 1

Fig. 2

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This invention relates to improvements in instruments to facilitate the examinations of and injections into the human uterus and Fallopian tubes.

One object of the invention is to obtain an instrument for a sure retaining of the cervix in a fixed position and at the same time to create a sure guiding of an injection device into the uterus space.

When carrying out examinations of the uterus and Fallopian tubes one uses, according to the examinations, fluid or gas injections as a method of help, these injections are carried out through the cervix. Contrast fluid is injected before X-ray examinations and flushing fluid after operations. Gas injection, e.g. the example carbon-dioxide, is carried out to determine if the Fallopian tubes give free passage. It is, therefore, important that the cervix is held in an unchanging position so that the opening of the cervix can be found without difficulty and the insertion of the injection cannula greatly facilitated. This retention is normally obtained with the use of foams, but this method often causes injury and abrasion to the delicate tissues and at the same time difficulty can be experienced in the entry into the uterus through the cervix.

A further object of the invention is to overcome these difficulties.

With these and further objects in view the invention is essentially characterised in the fact that the instrument consists of an air-withdrawal vacuum-acting suction cup for enveloping and retaining the cervix, which works in cooperation with an opening device for the cervix, whereupon both the suction cup as well as the opening device form, in the operation position of the cervix, seals against the entry of air through the suction cup opening against the cervix.

One embodiment of the invention is illustrated in the accompanying drawings, wherein:

FIGURE 1 shows a longitudinal section of the instrument in position against the cervix, and

FIGURE 2 shows a corresponding view of the instrument in the operating position with the indented cervix.

The instrument consists of a cannula tube 1, which is encompassed, with certain clearance, by an outer tube 2, this clearance forms a channel 3 between these two tubes. The outer tube is anchored in the forward section 4a, of a transversely divided handle, the rear section 4b, of which is, through the medium of a threaded stub 5, attached in the forward handle section and contacts against a flexible seal ring 6, which is situated around the cannula tube 1. This seal ring, which lies against the bottom of a recess corresponding to the stub 5, in the forward handle section, prevents air leaking along the outside of the cannula tube into the rear end of the outer tube, and retains the cannula tube with a certain frictional force in the set position. In the forward handle section is a transverse tube 7 from the outer tube for connecting to a vacuum pump, which is not shown in the drawing, or a similar device for exhausting air from the suction cup. The outer pipe has, at its forward end, a flange equipped internally threaded muff 8, the end flange of which lies against a rubber gasket or something similar 9, which in its turn lies against the outside of the suction cup. A flanged nipple 10 is threaded in the end muff from the inside of the suction cup, the cannula tube passes through this nipple, with a clearance, into the suction cup. The cannula tube has an end head 11 at this end, which is, for example, in the form of a cone as shown in the drawing. The nipple can be screwed on with a suitable key and its flange presses a washer against the inside of the suction cup. The outer pipe is retained to the suction cup during sealing through the above-mentioned rubber gasket 9 and is in communication with the interior of the suction cup by means of the clearance in the nipple. The suction cup circular suction opening 12 has an opening edge, which merges into the wall section of the suction cup, which is directed considerably outwards and forms, with the extension of the suction opening plane, a very small angle. In this way the suction cup obtains, in combination with the suction opening, a considerable transverse curve 13, which is shown in the drawing. It is advantageous if the suction cup is of transparent plastic or something similar.

The rear handle section 14b has in its outer end an axial longitudinal recess 14, which contains, if determined suitable, a flexible seal ring 15, which encircles the cannula tube 1. In the recess is threaded a cannula tube retainer 16, the length of which corresponds to the length of the recess, the outer end of this retainer has an end head 17, which is used for screwing the cannula tube retainer 16 to the outer handle section 4b. This retainer has also, seen from the outer end, an axial recess, in which a connecting tube 18 is threaded, and is of such a length that it normally reaches the bottom of the recess so that through the pressure of another flexible seal ring 19 around the cannula tube obtains frictional retention of the cannula tube. This reaches a little way into the connecting tube with its outer end in connection against a shoulder 20. The connecting pipe can house any suitable outer connecting head for connection to gas or liquid pipe connections. On the drawing is shown a normal connecting part 21 for a syringe. The cannula tube retainer has in its outer end a divided handle section A, B and C, which show how far the cannula head 11 has reached out in connection with the suction cup. A shows the bottom position of the end head and C shows the maximum outer position. B shows the intermediary position.

When the instrument is used the suction cup and the cannula tube end head are inserted in the cervix so that the suction cup opening surrounds the cervix annular muscle 25, and the forward end of the end head enters the cervix as shown in FIG. 1 on the drawing. This is facilitated by the transparency of the suction cup. The end head should be in the bottom position with the cannula tube retainer 16 completely screwed out so that the mark A is just outside the outer end edge of the rear handle section 4b. The inner air should now begin to be exhausted by the vacuum pump or similar device from the suction cup through the outer tube. The formation of a vacuum will cause the annular muscle to be inducted through the suction cup opening between the opening edge and the cannula tube end head, as is shown in FIG. 2; this will cause an outward folding of the ring muscle 25 into the suction cup, and it will also glide over the end head so that the suction cup is formed and a sealing surface against the inducted muscle, and a powerful retention by the suction cup will be obtained. During this time, or immediately after, the cannula tube end head should be inserted through the cervix by screwing in the cannula tube retainer 16 into the handle. For this movement the connecting tube 18, inner shoulder 20, moves the cannula tube forward and the insertion is judged
by marks B and C. In this way the cervix is opened so that free injection of liquid or gas can be carried out. With greater insertions the cervix can also be formed into a complete fold at the base of the end head, as shown in Fig. 2, with further improved sealing conditions.

If the cannula tube end head is to be withdrawn or is to be adjusted in the reverse direction, the rear hollow section should be loosened somewhat, so that the seal ring frictional tension decreases. When the cannula tube retainer 16 is screwed out, the cannula tube will come with it owing to the frictional effect of the seal ring 19.

With the above described device one obtains a simple and effective instrument which, without pain or injury, retains the cervix and holds it in an unchangeable position for the intended purpose.

As different conditions require cannula end heads of various sizes as well as various forms, for example flattened form, ball form etc., the instrument has been constructed so that the cannula tube and end head can be easily replaced by drawing out the cannula tube through the suction cup and fitting a new cannula tube and end head into the instrument through the suction cup. This is of great advantage when fitting surgical appliances as the cannula tube and end head can be replaced without the aid of tools and without any great loss of time.

What I claim is:

1. An instrument for facilitating the examination of and insertion into the human uterus and Fallopian tubes, comprising an outer tube having opposite ends, a suction cup of transparent material operably connected to one end of said outer tube, said suction cup being adapted to envelop and retain the cervix, a cannula tube of lesser diameter than the outer tube coaxially positioned within the outer tube and having opposite end portions with one of said end portions being located within said suction cup, a head on said one end portion adapted to open the cervix and permit injection of fluid into the uterus, means defining a passageway between the suction cup and said outer tube to permit air to be exhausted from the interior of the suction cup into the space between the outer tube and the cannula tube for sealing the entry of air through said cup against the cervix, handle means supporting said outer tube and cannula tube, said handle means including front and rear sections, said front section having a bore in each end thereof, said outer tube being anchored in one of the bores of the front section, the rear section being secured in the other of the bores of the front section, said rear section having an axially threaded recess in its other end, a retainer having a bore threaded into said recess and including means allowing said retainer to be turned externally with respect to said handle means, and said retainer being operably connected with the end of said cannula tube remote from the head for effecting axial displacement of the cannula tube respecting said suction cup, and a connection tube extending longitudinally in the bore of said retainer and communicating with the end of said cannula tube remote from the head for allowing fluids to be injected into the uterus through said connection tube, cannula tube and head.

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