Title: DEVICE FOR AN ANAESTHETIC NEEDLE

Abstract: The present invention relates to an arrangement (1) for an anaesthetic needle (2) for internal periovular blocking (POB) in conjunction with egg aspiration. In accordance with the invention a syringe (4), which is so arranged as to be capable of being filled with an anaesthetic, is intended to be capable of being fitted with a needle (2), the length of which is sufficient to reach the patient's ovarian capsule from outside. The needle (2) is so arranged as to support a transducer (5) arranged for ultrasound guiding between the respective ends 15 (6, 7) of the needle.
Device for an anaesthetic needle

The present invention relates to an arrangement for an anaesthetic needle for internal periovarial anaesthesia in conjunction with egg aspiration.

GENERAL DESCRIPTION OF PREVIOUSLY DISCLOSED METHOD AND ARRANGEMENT FOR ANAESTHESIA

In vitro fertilization (IVF) and embryo transfer (ET) are a well developed technique for the treatment of various forms of childlessness. At the majority of IVF clinics, egg aspiration is performed transvaginally with ultrasound guiding. Egg aspiration involves passing the aspiration needle through the vaginal wall for the purpose of puncturing follicles in the ovary. The procedure is relatively short and lasts between 10 and 30 minutes, among other things depending on the number of eggs and the position of the uterus and the ovary. The perception of pain during egg aspiration varies from individual to individual, but is described as relatively high if adequate analgesia is not administered. Analgesia in conjunction with egg aspiration today often consists of premedication 1-2 hours before the aspiration procedure in the form of a sedative preparation of some kind. A paracervical block (PCB), local anaesthesia with lidocaine, and possibly fast-acting morphine are administered intravenously during the procedure if the need arises. The alternative is for the procedure to be performed under general anaesthesia, although this is less common.

PCB has been shown to give significantly reduced pain compared with a placebo or no PCB. In spite of this, the anaesthetic effect of PCB has been called into question and its
significance is still unclear. One possible explanation why PCB does not give a strong anaesthetic effect in conjunction with egg aspiration is that the upper part of the vagina is on the whole innervated by autonomous nerve fibres and to an extremely small degree by somatic nerve fibres, and it is accordingly insensitive to stimuli such as needle pricks.

The principal object of the present invention is thus, in the first instance, to solve the problem of being able to anaesthetize intended areas in an effective and in the most pain-free manner possible with an anaesthetic needle of the kind described above.

The aforementioned object is achieved by means of an arrangement in accordance with the present invention, which is characterized essentially in that a syringe, which is so arranged as to be capable of being filled with an anaesthetic, is fitted with a needle, the length of which is sufficient to reach the patient's ovarian capsule from outside, and in that the needle is so arranged as to support a transducer arranged for ultrasound guiding between the respective ends of the needle.

The invention is described below as a preferred illustrative embodiment, in conjunction with which reference is made to the accompanying drawings, in which:

Figs. 1-4 show the tip of an anaesthetic needle in accordance with the invention viewed from above, from one end of the needle, from the side, and also from the side but rotated through 90° and provided with grooves;

Fig. 5 shows the needle attached to an anaesthetic syringe;

Fig. 6 shows the needle and the syringe assembled on a transducer and a needle guide;
Fig. 7 shows an ultrasound image displayed on a screen during the anaesthesia procedure;

Figs. 8-11 show the handle of the needle viewed respectively from the sides and from the ends.

An arrangement 1 for an anaesthetic needle 2 in accordance with the present invention for internal periovajral anaesthesia in conjunction with egg aspiration comprises means 3 to enable a syringe 4, which is so arranged as to be capable of being filled with a suitable anaesthetic, to be connected to an aforementioned needle 2. The length $L$ of the aforementioned needle 2 is selected to be sufficient to permit the needle 2 to reach the patient's ovarian capsule from outside. The needle 2 is also so arranged as to support a transducer 5 intended for ultrasound guiding between the respective two ends 6, 7 of the needle. The transducer 5 is so arranged as to be capable of being supported by a needle guide 8, which is situated between the syringe 4 and the tip 9 of the needle. The aforementioned needle guide 8 is preferably in the form of two annular holders 10, 11 situated at a mutual distance $A$ from one another and a tube 12 connecting these together for the purpose of accommodating the main part of the needle 2 therein.

The aforementioned needle 2 exhibits a tip 109 that is so arranged as to increase the visualization of the needle in the area of the tip 109 during the period for which ultrasound transmission takes place. For this purpose, the tip 109 of the needle is provided with a number of grooves 50 so arranged as to extend at an angle $X$ to the longitudinal extent 51 of the needle. The grooves 50, which can exhibit an undulating cross section, are preferably situated at a uniform mutual distance $A$ from one another and extend essentially parallel with the
outermost obliquely cut end part 52 of the tip 109 of the needle.

The needle 2 preferably consists of steel with an external diameter of 0.8-1.2 mm and with a length L of between 200 and 300 mm. The internal diameter of the needle 2 can be between 0.6 and 1.0 mm. A handle 13, which is attached to the needle 2 at its rear end 7, can also consist of steel and appropriately exhibits finger grips 14 and an attachment 15 for a Luer Lock syringe 4 in accordance with the Figures.

DESCRIPTION OF A NEW METHOD WITH AN ARRANGEMENT IN ACCORDANCE WITH THE INVENTION

The preparations in advance of egg aspiration are performed in accordance with the established procedure. A sterile syringe 4 (5 ml) is filled under sterile conditions with 5 ml of Xylocaine® (conc. 5 mg/ml) or some other suitable anaesthetic. The ovary is visualized with ultrasound so that the optimal direction of puncture is obtained. A needle 2 for periovvarial blocking (POB) with an attached syringe 4 is introduced into the needle guide 8 on the transducer 5. The vaginal mucus membrane is punctured, and 0.5-1.0 ml of Xylocaine are injected. The needle 2 is introduced for a further ca 5 mm, after which 1.0-2.0 ml of Xylocaine are injected. The needle 2 is passed under ultrasound guiding into the ovarian capsule and 1.0-2.0 ml of Xylocaine are injected. The needle 2 is then removed from the patient. Under ultrasound guiding, the follicles are then punctured in accordance with the customary, previously disclosed procedure via the lateral fornix.

In conjunction with follicle aspiration for in vitro fertilization, the method commonly used today involves
anaesthesia that is administered into the vaginal wall with an ordinary cannula. The needle 2 in accordance with the present invention is sufficiently long, however, to be used with ultrasound, with the result that the anaesthetic fluid can be administered precisely adjacent to the follicle. This has been found to be a much more effective method of anaesthesia than with previously disclosed procedures.

DESCRIPTION OF THE PRODUCT

In order to be able to administer an anaesthetic adjacent to the ovarian capsule, a needle in accordance with the invention is now available, which is so arranged as to be capable of being used with guiding by ultrasound. The needle is manufactured from two components.

I. A needle blank 2 made of stainless steel, which is 0.8-1.2 mm in diameter and has a length of 200-300 mm. The needle 2 fits existing needle guides for follicle aspiration.

II. A handle 3 made of stainless steel, which is machined to form a finger grip 14 and a connection 15 for a Luer Lock syringe 4.

A 5 ml sterile syringe 4 that is filled with an anaesthetic, for example in accordance with the recommendation, is attached to the connection 15 for the Luer Lock syringe 4.

The needle 2 is preferably provided with grooves 50, which means that the tip 109 of the needle 2 is visualized under ultrasound. Together with the grooves 50, the length L of the needle is a critical factor enabling it to be used for ultrasound-guided injection adjacent to the follicular capsule. Grooves are not used, however, if the needle 2 has an external diameter of less than 1.1 mm, as the tip 9 will then be clearly
visible without the grooves. The execution of the tip is unique in order to create the most friction-free penetration possible.

The ultrasound image in Fig. 7 shows how the needle 2 has reached its target, and an ovarian follicle 16 is awaiting its turn to be gathered in accordance with a previously disclosed procedure and with previously disclosed means.

The invention is naturally not restricted to the embodiments described above and illustrated in the accompanying drawings. Modifications are possible, in particular with regard to the nature of the various parts, or by the use of equivalent technology, but without departing from the area of protection afforded to the invention, as defined in the Patent Claims.
Patent Claims

1. Arrangement (1) for an anaesthetic needle (2) for internal periovular blocking (POB) in conjunction with egg aspiration, characterized in that a syringe (4), which is so arranged as to be capable of being filled with an anaesthetic, is connected to a needle (2), the length (L) of which is sufficient to reach the patient's ovarian capsule from outside, and in that the needle (2) is so arranged as to support a transducer (5) intended for ultrasound guiding between the respective ends (6, 7) of the needle.

2. Arrangement in accordance with Patent Claim 1, characterized in that the transducer (5) is supported by a needle guide (8).

3. Arrangement in accordance with Patent Claim 2, characterized in that the aforementioned needle guide (8) is situated between the syringe (4) and the tip (9) of the needle.

4. Arrangement in accordance with Patent Claim 3, characterized in that the needle guide (8) is in the form of two annular holders (10, 11) situated at a mutual distance (A) from one another and a connecting tube (12) for the purpose of accommodating the needle (2) therein.

5. Arrangement in accordance with one or other of the foregoing Patent Claims, characterized in that the needle (2)
exhibits a tip (109) that is so arranged as to increase its visualization during ultrasound transmission.

6. Arrangement in accordance with Patent Claim 5, characterized in that the tip (109) of the needle is provided with grooves (50), which means that the tip (109) of the needle (2) is visualized under ultrasound.

7. Arrangement in accordance with Patent Claim 6, characterized in that the grooves (50) are so arranged as to extend at an angle (X) to the longitudinal extent (51) of the needle.

8. Arrangement in accordance with Patent Claim 7, characterized in that the grooves (50) are situated at a uniform mutual distance (A) from one another, and in that the aforementioned grooves (50) extend essentially parallel with the obliquely cut end part (52) of the tip (109) of the needle.

9. Arrangement in accordance with one or other of the foregoing Patent Claims, characterized in that the needle (2) consists of steel with an external diameter of 0.8-1.2 mm and with a length (L) of 200-300 mm.

10. Arrangement in accordance with one or other of the foregoing Patent Claims, characterized in that a handle (13) for the needle (2) consists of stainless steel and appropriately exhibits finger grips (14) and an attachment (15) for a Luer Lock syringe (4).
INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 2004/001233

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: A61B 17/435, A61M 5/46
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: A61B, A61M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE, DK, FI, NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

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[ ] Further documents are listed in the continuation of Box C.

[ ] See patent family annex.

* Special categories of cited documents:
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13 December 2004

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