

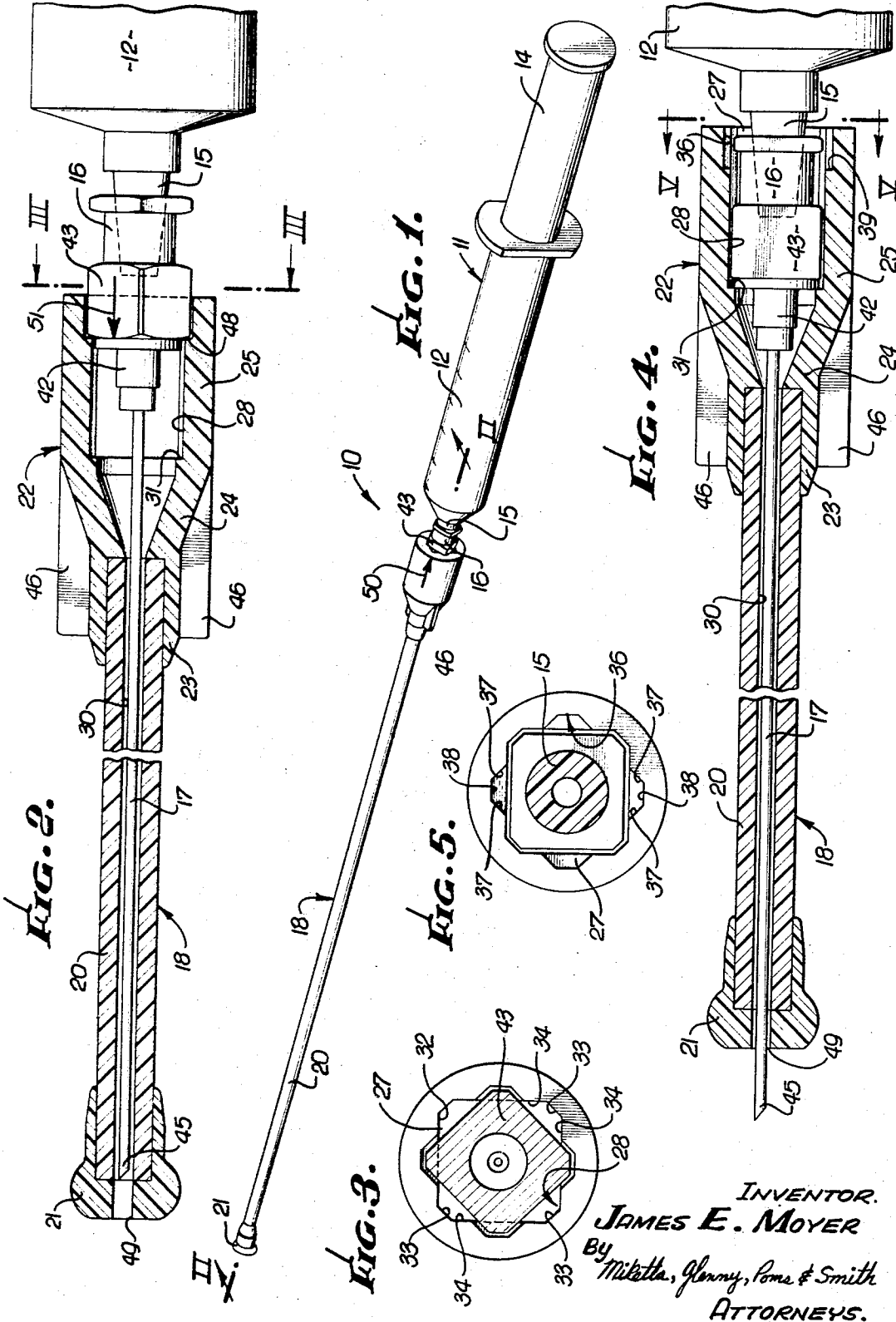
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GUIDE AND POSITIONING MEANS FOR A NEEDLE

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**GUIDE AND POSITIONING MEANS
FOR A NEEDLE**

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ABSTRACT OF THE DISCLOSURE

A protective guide and positioning sheath for an elongated needle having a hub of well known construction. The sheath has coaxial angularly offset positioning recesses of polygonal transverse section to cooperate with the hub for selective longitudinal positioning of the needle point in relation to the sheath end in projected and retracted positions.

This invention relates to a means for facilitating the administration of a paracervical bloc and more particularly to a novel construction of a needle guide and positioning member utilized in injection procedure of paracervical bloc anaesthesia.

Generally speaking, a paracervical bloc is administered to a patient for relief of first-stage labor pain. It comprises injecting an anaesthetic agent into paracervical tissues adjacent the junction of the cervix and vagina in the lateral fornix. The depth of injection has been generally suggested at between 1.5 to 2.0 cm., however, a depth in the order of 0.7 cm. is considered preferable because the danger of puncturing blood vessels is greatly minimized thereby.

Prior proposed means for administering a paracervical bloc have included a needle of approximately five or six inches in length and a guide for the needle of slightly less length. Such prior proposed guides have comprised simply a tubular member having a through bore to receive the needle, the distal end having an enlargement and the proximate end having a funnel to facilitate introduction of the needle into the guide. In injection procedure, such a guide has been introduced into the body cavity and the distal end properly located by palpation against the wall of the cavity. The needle is then inserted in the funnel end, a syringe attached to the needle, and the injection made by advancing the needle point beyond the end of the guide member a distance determined primarily by the doctor.

In other proposed devices for administering an anaesthetic agent at a remote portion of a body cavity, guide devices have been provided for a needle such as shown in Patents 2,712,314, 2,740,404 and 2,880,724. The guide devices in these patents were primarily for administering a pudental bloc in obstetrical use and for relief of pain in the second labor stage.

The prior proposed devices for guiding an elongated needle into a body cavity have had several disadvantages. Some of the disadvantages include lack of precise control of the depth of penetration of the needle into the body tissue; difficulty in introducing the needle point into a guide member when the guide is in position in the body cavity; the possibility that during introduction or retraction of the needle that the needle point may scrape or lacerate wall surfaces of the body cavity; lack of positive control and positioning of the needle guide during the injection procedure; and the prior devices were often of special form and construction and costly to manufacture.

The primary object of the present invention is to disclose and provide a novel construction of a needle guide

and positioning means which facilitates injection procedure for a paracervical bloc anaesthesia or the like.

An object of the invention is to disclose and provide a needle guide and positioning member which facilitates positioning of an injection needle in a body cavity without harm or danger to the walls of the cavity.

Another object of the invention is to disclose and provide a guide and positioning means for an elongated needle wherein the needle is positively prevented from advancement during introduction of the needle and guide into a body cavity and whereby depth of needle penetration is predetermined and positively controlled.

Another object of the invention is to disclose and provide a needle guide and positioning member wherein means at the proximate end of the member are provided for precisely positioning a needle in either retracted or projected position and wherein a change from either of such positions requires withdrawal of the needle and turning or rotating the needle to the other position.

Another object of the present invention is to disclose and provide a needle guide and positioning means which is inexpensive and simply manufactured and which may be disposable.

Various other objects and advantages of the present invention will be readily apparent from the following description of the drawings in which an exemplary embodiment of the present invention is shown.

In the drawings:

FIG. 1 is a perspective view of an assembly of a syringe, needle and needle guide and positioning member embodying the present invention.

FIG. 2 is a fragmentary enlarged sectional view taken in a plane passing through the axis of the assembly and showing the needle in retracted position.

FIG. 3 is a transverse sectional view taken in the plane indicated by line III—III of FIG. 2.

FIG. 4 is a fragmentary enlarged sectional view taken in a plane passing through the axis of the assembly and showing the needle in projected position.

FIG. 5 is a sectional view taken in the transverse plane indicated by line V—V of FIG. 4.

In FIG. 1, there is generally shown an assembled unit 10 which may be employed in administering a paracervical bloc in obstetric anaesthesia. The unit 10 comprises a suitable syringe means 11 including a syringe barrel 12 and a plunger 14, the barrel 12 having a tapered fitting 15, such as a Luer taper. Tapered fitting 15 may be received within a hub means 16 which is provided at one end of an elongated needle member 17. A protective needle guide and positioning member 18 ensheathes needle member 17 and a portion of the hub means 16. The assembled unit 10 shown in FIG. 1 may be readily handled and manipulated as a unit. The syringe means 11 and the needle member 17 may be of well known construction and will not be described in detail.

The needle guide and positioning means 18 may be made of any suitable, flexible, resilient plastic material of medical grade. Guide means 18 may include an elongated hollow, cylindrical tubular member 20 having at its end distal from the syringe means 11, an enlarged bulbous end fitting 21 secured thereto in suitable manner. The bulbous fitting 21 provides an enlarged dull, virtually cornerless, soft end for reducing irritation and damage to internal tissues.

At the end of tubular member 20 proximate to the syringe means 11, a socket means 22 may be provided. Socket means 22 may comprise a cylindrical portion 23 fitted over the end of tubular portion 20 and integral with an outwardly flaring frustoconical portion 24 which is integral with an enlarged cylindrical portion 25. The socket means 22 at cylindrical portion 23 may be provided with an entrance opening 27 which leads to a deep recess por-

tion 28 extending from the entrance opening toward the distal end and communicating with a conical portion which leads to the needle passageway 30 in the tubular portion 20. The deep recess portion 28 extends for approximately the length of cylindrical section 25 and is defined by an annular shoulder 31 at the bottom of the deep recess portion 28. The deep recess portion 28 is generally of square or polygonal cross-section, as best seen at 32, FIGS. 3 and 5, the corners of the square cross-section being defined by corner side walls 33 at approximately 45° to the side walls 34 of the recess portion 28.

At the entrance opening 27, the socket means includes a shallow recess portion 36 extending for only a portion of the deep recess portion and comprising relieved portions of the cylindrical section 25 so as to superimpose over the deep recess portion a shallow recess portion of generally square or polygonal section, as defined by walls 37 and 38 which lead to a transverse shoulder 39 formed as a ledge between the corners of the deep recess portion. Shoulders 38 are thus disposed at 45° to the corners of the deep recess portion passageway.

The needle member 17 carries the needle hub means 16 at its proximated end, said hub means 16 including a stepped cylindrical securement portion 42 and an enlarged hub portion 43 of polygonal cross-sectional configuration corresponding generally to that of the passageways provided by the shallow and deep recesses 28 and 36. The cross-sectional area of the needle hub portion 43 may be slightly less than that of the passageways as described above so that the hub portion 43 may be readily slidably fitted in said recess portions.

The opposite end 45 of the needle member 17 may be provided with a bevel point in well known manner.

The socket means 22 may also include means to facilitate handling and manipulating the needle guide with fingers of a user. Such means may comprise extensions of the cylindrical portion 25 in the form of elongated tabs 46 having a suitable thickness and extending in integral manner from the frustoconical portion 24 and along the forward cylindrical portion 23 of the socket means. Tabs 46 may be integral and provide a pressure seating means to facilitate turning the needle guide when it becomes necessary during the procedure of administering a paracervical bloc anaesthesia.

The socket means 22 of the needle guide and positioning means 18 is adapted to receive the enlarged polygonal needle hub portion 43 in one position in which the forwardly directed faces 48 will abut against the shelves or shoulders 39 which serve as stop means to limit further longitudinal relative movement of the needle member 17 with respect to the needle guide tubular portion 20. As in FIG. 2, when the needle hub 43 is seated against the stop shoulder 39, the pointed end 45 of the needle 17 will be retracted within the end of the tubular member 20 and spaced from the distal opening 49 defined by the bulbous fitting 21. In this retracted position of the needle member 17, the needle is carried in an unarmed position and, at the same time, is operatively associated with the needle guide and positioning member 18 and the syringe means 11 which may contain the selected anaesthesia used in the administration of the paracervical bloc.

When a paracervical bloc is to be administered in accordance with techniques which may require the injecting of the anaesthetic agent into the paracervical tissues at the junction of the cervix and vagina, the doctor's examining finger locates the cervicovaginal fornix and the assembled unit is then directed into the body cavity so that the needle guide 18 follows the finger until the distal bulbous end 21 is properly positioned for the injection. The syringe means 12 with the attached needle 17 are moved rearwardly and away from the body cavity a distance slightly greater than the depth of the shallow recess portion so that the hub portion 43 clears the entrance opening 27. While the needle guide 18 is being held in proper position by contact of the tabs 46 with fingers or

hands of the doctor, the syringe means and needle member may be turned 45° in either direction so that the polygonal-shaped hub portion 43 will become aligned with the deep recess portion 28 as shown in FIGS. 4 and 5. To positively indicate such alignment with the deep recess, the guide 18 may have an indicia, mark, or other reference such as arrow 50 and the needle hub 43 may have an oppositely pointing arrow 51 which will be aligned with arrow 50 when the needle is positioned for arming. The syringe means and needle member may then be moved longitudinally relative to the needle guide and positioning member 18 and the hub portion 43 advanced into the deep recess portion until it is seated on the shoulder 31. In this advanced position, the needle member 17 has its pointed end 45 projecting from the opening 49 of the distal end portion 21 and has penetrated the tissues at the fornix as directed thereto by the doctor's examining fingers. The projection of the pointed end 45 of the needle member is a predetermined projection distance as defined by the distance between the shoulders 39 and 31 less the distance between the pointed end 45 and opening 49 when in retracted position. Thus, the depth of penetration of the pointed end 45 of the needle into the tissues of the body cavity is positively determined.

After the injection has been made, the assembled unit 10 may be withdrawn completely from the body cavity and, if desired, the needle member 17 may be moved into its protected retracted position before such withdrawal.

The needle member 17 may be of any selected length such as 6" and made of steel. At such length a 20 gauge standard 6" needle is generally flexible and capable of bending. Obviously unwanted bending of the needle member 17 is not desired because of the danger of accidentally piercing walls of the body cavity. Thus, the provision of a flexible, resilient needle guide member, such as described above, not only prevents the needle from unwanted bending, but when the needle member is associated with the guide member in retracted unarmed position, the blunt bulbous distal end 21 prevents injury to the tissues or the walls of the body cavity as the guide and needle member are being introduced into the body cavity. Since some bending of the needle and guide member may be necessary in order to properly position the distal end 21 against the paracervical tissues, the needle guide member 18 readily permits such bending while protecting the needle member and the pointed end 45.

During the procedure of administering a paracervical bloc, the needle guide member 18 may become relatively slippery and difficult to manipulate because of the presence of body fluids. The finger tabs 46 on the socket means 22 provide means for placing fingers to either hold or steady the needle guide in a selected position, or to selectively turn the needle guide. Thus the needle guide while it is being used in the administration of a paracervical bloc, may be readily turned or held against turning by the finger tabs 46.

It will be readily apparent that the hub portion 43 may have a cross-sectional area other than polygonal or that it may carry projections thereon which may cooperate with spaced stop shoulders 39 and 31 in socket means in a manner similar to that described above. While this configuration holds the needle member from turning relative to the needle guide member, the arrangement also prohibits advancement of the needle member by the stop 39 so that inadvertent projection of the pointed needle end is obviated. In this respect, the needle member may be considered to be locked with respect to the needle guide member, except for movement in one direction, that is, longitudinal movement away from the body cavity.

It will be understood that the procedure for administering a paracervical bloc may be varied and if desired only the needle guide and positioning member 18 with the needle member 17 held therein in retracted position may be introduced and positioned in the body cavity. The

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syringe means 12 may then be attached to the end of the needle. This is readily accomplished because the tabs on the needle guide may be used to hold the needle guide against rotation while the syringe means is being connected to the hub of the needle by means of the well known Luer taper. During such connection, it will be apparent that the needle hub is restrained against rotation by the needle guide. After the connection between the syringe means and the needle has been made, the needle may be withdrawn longitudinally from the shallow recess and then turned 45° for insertion of the needle hub into the deep recess so that the pointed end of the needle may make the desired penetration of body tissue.

Various modifications and changes may be made in the construction of the needle guide and positioning member to provide a retracted or unarmed position of the needle and a projected or armed position of the needle. All such modifications and changes which come within the spirit of this invention and which come within the scope of the appended claims are embraced thereby.

I claim:

1. Means to facilitate administering a paracervical bloc anaesthesia or the like and including an elongated needle having a point at a distal end thereof and an enlarged hub means at the proximate end thereof, the combination with said needle and hub means of:

a flexible plastic protective guide and positioning member ensheathing said needle and comprising an elongated tube portion receiving said needle therein;

socket means cooperable with said enlarged hub means for positioning the needle point in retracted and in projected position;

said socket means including a deep recess portion slidably receiving said enlarged hub means in one position;

and a shallow recess portion at the opening of the deep recess portion and angularly offset therefrom for positioning said enlarged hub means with the needle point in another position;

the overall length of said recess portions of said socket means and elongated tube portion being correlated to the length of the elongated needle whereby reception of the hub means respectively in the shallow and deep recess portions positions said needle point in retracted and projected relation to the tube portion.

2. The combination as stated in claim 1 including outwardly directed spaced projections on said tube portion adjacent the socket means to facilitate holding or turning the needle guide member.

3. The combination as stated in claim 1 wherein said

deep and shallow recess portions each include means for seating said hub means with the needle in selected longitudinal relation with the guide member.

4. The combination as stated in claim 3 wherein said enlarged hub means includes means cooperable with each of said seating means.

5. An integral flexible guide and positioning member for an elongated needle having hub means, comprising an elongated flexible tubular portion;

a socket means at one end of tube portion, said socket means including

a first recess portion having first internal stop means to limit longitudinal movement of the needle in one position,

and a second recess portion having second internal stop means angularly spaced from the first recess portion to limit longitudinal movement of the needle in another position;

said tube portion having a length measured from the first internal stop means whereby the needle is in retracted position in relation to the tube portion when the hub means is stopped by the first internal stop means,

said tube portion having a length as measured from the second internal stop means whereby a needle of selected length is positioned with its point projecting from the end of the tube portion a predetermined selected distance.

6. A member as stated in claim 5 wherein said recess portions each include means for holding a needle hub means against rotation relative thereto.

7. A member as stated in claim 5 including external longitudinally extending tab means adjacent the socket means.

8. In the combination as stated in claim 1 wherein said enlarged hub means is of non-circular cross-section, and said recess portions are of corresponding non-circular cross-section to receive said hub means, whereby said needle and guide positioning member are interlocked against relative rotation.

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