

A POINTED GEOMETRIC CONFIGURATION FOR A CANNULA TIP AND A METHOD FOR FORMING SAID TIP

FIELD OF INVENTION

5

The present invention relates to a pointed geometric configuration for a cannula tip and a method for forming said tip.

BACKGROUND

10

A convention employed in the specification is that the term "proximal" denotes a direction closest to a user, while the term "distal" denotes a direction furthest from the user.

15

A proximal end of a cannula is typically configured for coupling to a liquid delivery device, while a distal end of the cannula is typically provided with a pointed tip geometry for piercing a patient's flesh or tissue so as to deliver liquids to the patient.

20

A substantial amount of research by many parties has been expended on improving the pointed tip geometry at the distal end of the cannula. However, efforts at improving the pointed tip geometry of the distal end of the cannula were directed towards minimising needle penetration force to ensure passage of the cannula through the patient's flesh or tissue, and not towards other aspects. Unfortunately, the pointed tip geometry which is able to minimise needle penetration force also regularly damages a catheter used to house the cannula. The damage caused to the catheter leads to failure of the catheter either before or during use. This is most undesirable in view of the adverse effects which would be felt by the patient.

25

Thus, there is a need for a pointed tip geometry at the distal end of the cannula which would not damage the catheter which houses the cannula.

30

SUMMARY

In a first aspect, there is provided a cannula having a pointed geometric configuration at one end. The pointed geometric configuration comprises a primary bevel; a pair of tip bevels on an opposing surface to the primary bevel; and a smoothened section at an intersection junction of each of the

pair of tip bevels and the primary bevel. It is advantageous that the smoothened section excludes burrs.

It is preferable that the primary bevel is provided on the cannula at a first planar angle with reference to a first reference axis of the cannula. Preferably, the first planar angle is in a range of 17° to 21° .

It is also preferable that the pair of tip bevels is provided on the cannula at a second planar angle with reference to a second reference axis of the cannula. Preferably, the second planar angle is in the range of 13° to 19° .

In a second aspect, there is provided a method to form a cannula having a pointed geometric configuration at one end, the cannula comprising a primary bevel at the one end of the cannula, and a pair of tip bevels on an opposing surface to the primary bevel. The method comprises smoothening an intersection junction of each of the pair of tip bevels and the primary bevel. It is preferable that the smoothening is carried out using at least one process selected from, for example, grinding, filing, chiseling and so forth. The method may further comprise removal of burrs from the intersection junction.

DESCRIPTION OF FIGURES

In order that the present invention may be fully understood and readily put into practical effect, there shall now be described by way of non-limitative example only preferred embodiments of the present invention, the description being with reference to the accompanying illustrative figures.

Figure 1 shows a side view of a preferred embodiment of a distal end for a cannula.

Figure 2 shows a top view of the distal end of Figure 1.

Figure 3 shows a perspective view of the distal end of Figure 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring to the Figures, there is provided a cannula 20 having a pointed geometric configuration at a distal end 22, while the proximal end (not shown) is configured for coupling to a liquid delivery

device. The cannula 20 is made from stainless steel or similar rust resistant metals/alloys and includes a centrally located channel 24 for the passage of fluids.

The pointed geometric configuration at the distal end 22 comprises a primary bevel 26 at the distal end 22 of the cannula 20. The primary bevel 26 is provided on the cannula 20 at a first planar angle with reference to a first reference axis (x-axis as shown in the Figures) of the cannula 20. The first planar angle is in a range of 17° to 21° , and is preferably 19° .

The cannula 20 also comprises a pair of tip bevels 28 on an opposing surface 29 to the primary bevel 26 at the distal 22 end of the cannula 20. The pair of tip bevels 28 is provided on the cannula 20 at a second planar angle with reference to a second reference axis (z-axis as shown in the Figures) of the cannula 20. The second planar angle is in the range of 13° to 19° , and is preferably 16° .

Finally, the cannula 20 includes a smoothed section 30 at an intersection portion of each of the pair of tip bevels 28 and the primary bevel 26. The smoothed section 30 can be formed by carrying out at least one process such as, for example, grinding, filing, chiseling at the intersection portion of each of the pair of tip bevels 28 and the primary bevel 26. The respective smoothed section 30 at an intersection portion of each of the pair of tip bevels 28 need not be identical. The process to form the smoothed section 30 can be carried out using an automated process or by a manual process. The formation of the smoothed section 30 leads to removal of burrs. It should be noted that the formation of the primary bevel 26 and the pair of tip bevels 28 can be carried out using any known process and mechanism.

It should be appreciated that the cannula 20 having the pointed geometric configuration at the distal end 22 is not only configured to minimise needle penetration force into a patient's flesh or tissue. It should be appreciated that the smoothed section 30 also ensures that damage to a catheter (not shown) used to house the cannula 20 is minimised.

Whilst there have been described in the foregoing description preferred embodiments of the present invention, it will be understood by those skilled in the technology concerned that many variations or modifications in details of design or construction may be made without departing from the present invention.

CLAIMS

1. A cannula having a pointed geometric configuration at one end, the pointed geometric configuration comprising:
 - 5 a primary bevel;
 - a pair of tip bevels on an opposing surface to the primary bevel; and
 - a smoothed section at an intersection junction of each of the pair of tip bevels and the primary bevel.
- 10 2. The cannula of claim 1, wherein the primary bevel is provided on the cannula at a first planar angle with reference to a first reference axis of the cannula.
3. The cannula of claim 2, wherein the first planar angle is in a range of 17° to 21° .
- 15 4. The cannula of any of claims 1 to 3, wherein the pair of tip bevels is provided on the cannula at a second planar angle with reference to a second reference axis of the cannula.
5. The cannula of claim 4, wherein the second planar angle is in the range of 13° to 19° .
- 20 6. The cannula of any one of claims 1 to 5, wherein the smoothed section excludes burrs.
7. A method to form a cannula having a pointed geometric configuration at one end, the cannula comprising a primary bevel at the one end of the cannula, and a pair of tip bevels on an opposing surface to the primary bevel, the method comprising smoothing an intersection junction
25 of each of the pair of tip bevels and the primary bevel.
8. The method of claim 7, wherein smoothing is carried out using at least one process selected from a group consisting of: grinding, filing, and chiseling.
- 30 9. The method of either claim 7 or 8, further comprising removing of burrs from the intersection junction.