[0005]

However, in such a method, the microcatheter and the guide wire cannot be stably and easily inserted into the connection passage.

DISCLOSURE OF THE INVENTION

[0006]

Embodiments of the present invention provide an access port enabling a microcatheter or a guide wire to be stably and easily inserted into a connection passage.

[0007]

According to an aspect of the present invention, there is provided an access port used by being connected to a catheter, the access port including: a port body including a liquid storage portion; and a diaphragm body that is held by the port body and covers the liquid storage portion, in which the port body includes a connection passage connected to the liquid storage portion to allow the liquid storage portion to communicate with an inside of the catheter, and in a cross-section along an axial direction of the connection passage at a connection position where the connection passage is connected to the liquid storage portion, a length in a direction perpendicular to the axial direction between a surface of the diaphragm body opposite to the liquid storage portion and an inner surface of the liquid storage portion gradually decreases as it proceeds away from the connection position in an inclined region exceeding half of the liquid storage portion along the axial direction, wherein a surface of the diaphragm body opposite to the liquid storage portion has a first surface located on a side away from the connection position in the axial direction, and a second surface located on a side closer to the connection position in the axial direction with respect to the first surface and inclined with respect to the first surface, a length of the first surface along the axial direction is longer than a length of the second surface along the axial direction, the first surface is inclined with respect to the axial direction toward a side away from the inner surface of the liquid storage portion as it approaches the connection position in the axial direction, and an inclination angle of the first surface with respect to the axial direction is larger than an inclination angle of the second surface with respect to the axial direction.

[0008]

In the access port, the inclined region may include a half region of the liquid storage portion on the side away from the connection position.

[0009]

In the access port, in the cross-section along the axial direction of the

connection passage, the inner surface of the liquid storage portion in the inclined region may be inclined with respect to the axial direction toward the side away from the diaphragm body as it approaches the connection position in the axial direction.

[0010]

In the access port, the inner surface of the port body may include a bottom surface that forms (defines) the liquid storage portion and a side surface that extends from the bottom surface to form (define) the liquid storage portion, and the bottom surface may be inclined with respect to the axial direction toward the side away from the diaphragm body as it approaches the connection position in the axial direction.

[0011]

In the access port, the bottom surface of the port body may include a connection bottom surface connected to a side wall surface to which the connection passage is open, and a main bottom surface located on the side away from the connection position with respect to the connection bottom surface in the axial direction, the main bottom surface may be inclined with respect to the axial direction toward the side away from the diaphragm body as it approaches the connection position, and the connection bottom surface may be inclined with respect to the axial direction toward the side closer to the diaphragm body as it approaches the connection position.

[0012]

In the access port, the port body may have a bottom wall portion that forms a bottom surface of the liquid storage portion, and a thickness of the bottom wall portion may gradually decrease as it approaches the connection position along the axial direction.

[0013]

In the access port, the port body may include a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that forms a side surface of the liquid storage portion, the side wall portion may include a protruding portion provided to be spaced apart from the bottom wall portion and having a facing guide surface facing the bottom surface, and the connection passage may open to the side surface at a position between the facing guide surface and the bottom surface.

[0014]

In the access port, the facing guide surface may have a concave surface recessed away from the bottom surface at a central portion in a width direction perpendicular to both the axial direction and a direction in which the facing guide surface faces the bottom surface.

[0015]

In the access port, the concave surface may be connected to a wall surface that forms (defines) the connection passage.

[0016]

In the access port, the inner surface of the port body may include a connection bottom surface provided at a position facing the facing guide surface, and a main bottom surface located on the side away from the connection position with respect to the connection bottom surface in the axial direction, the main bottom surface may be inclined with respect to the axial direction toward the side away from the diaphragm body as it approaches the connection position, and the connection bottom surface may be inclined with respect to the axial direction toward the side closer to the diaphragm body as it approaches the connection position.

[0017]

In the access port, the port body may include a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that extends from the bottom wall portion to form a side surface of the liquid storage portion, the side wall portion may include a pair of flat wall portions provided side by side in a circumferential direction, the connection passage may be open to the side surface at a position between the pair of flat wall portions, and the pair of flat wall portions may form a tapered side surface that extends linearly and is tapered toward the connection passage when observed from a direction parallel to a direction in which the side wall portion extends from the bottom wall portion.

[0018]

In the access port, the port body may include a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that extends from the bottom wall portion to form a side surface of the liquid storage portion, the side wall portion may include a pair of flat wall portions arranged side by side in a circumferential direction, the connection passage may be open to the side surface at a position between the pair of flat wall portions, and the bottom wall portion may include a guide rib extending linearly toward the connection position when observed from a direction parallel to a direction in which the side wall portion extends from the bottom wall portion.

[0019]

In the access port, the port body may include a bottom wall portion that forms a bottom surface of the liquid storage portion, and a side wall portion that extends from the bottom wall portion and forms a side surface of

the liquid storage portion, the diaphragm body may include an annular holding groove that extends in a direction parallel to a direction in which the side wall portion extends from the bottom wall portion and is open to the side opposite to the liquid storage portion, and the port body may include an annular holding protrusion portion that protrudes in the direction parallel to the direction in which the side wall portion extends from the bottom wall portion.

[0020]

In the access port, the port body may include a base member that forms a bottom surface and a side surface of the liquid storage portion, and a lid member that is fixed to the base member so that the diaphragm body is held between the base member and the lid member, the base member may include a bottom member that forms at least the bottom surface, and an annular member that is supported by the bottom member to surround the liquid storage portion, and the annular member may include a protruding portion that is provided so as to correspond to the connection position and protrude toward the liquid storage portion.

[0021]

In the access port, the annular member may be made of an X-ray opaque material.

[0022]

In the access port, the port body may include a surface layer member that forms the inner surface of the liquid storage portion and the connection passage, and the surface layer member may connect the inner surface of the liquid storage portion and the connection passage seamlessly.

[0023]

In the access port, the surface layer member may be made of metal.

[0024]

In the access port, an inner surface of the liquid storage portion may have a funnel shape.

[0025]

In the access port, in a cross-section perpendicular to the axial direction of the connection passage, an inner surface of the port body may be inclined with respect to a lower surface of the diaphragm body facing the inner surface of the port body so as to approach the diaphragm body on both outer sides in a direction along the lower surface.

[0026]

In the access port, the inner surface may extend in a U-shape in the cross-section perpendicular to the axial direction of the connection passage.

[0027]

In the access port, the bottom surface may extend in parallel to the axial direction in a cross-section along the axial direction of the connection passage passing through the connection position.

[0028]

In the access port, in the cross-section along the axial direction of the connection passage, a surface of the diaphragm body opposite to the liquid storage portion may be inclined with respect to the axial direction.

[0029]

[0030]

In the access port, the port body may have a built-in metal coil.

[0031]

In the access port, the port body may include at least two metal coils provided to be spaced apart from each other at positions around the liquid storage portion.

[0032]

In the access port, a surface of the diaphragm body opposite to the liquid storage portion may be exposed to a region between the two metal coils.

[0033]

In the access port, the port body may include at least two light emitters electrically connected to the metal coils.

[0034]

In the access port, the light emitting surfaces of the at least two light emitters may be exposed.

[0035]

In the access port, the port body may include a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that forms a side surface of the liquid storage portion, and the at least two metal coils may be incorporated in the side wall portion.

[0036]

In the access port, an axis of each metal coil may extend in a direction parallel to a direction in which the side wall portion extends from the bottom wall portion.

[0037]

According to embodiments the present invention, it is possible to provide an access port that enables a microcatheter or a guide wire to be stably and easily inserted into the connection passage.

Claims

1. An access port used by being connected to a catheter, the access port comprising:

a port body including a liquid storage portion; and

a diaphragm body that is held by the port body and covers the liquid storage portion, wherein

the port body includes a connection passage connected to the liquid storage portion to allow the liquid storage portion to communicate with an inside of the catheter, and

in a cross-section along an axial direction of the connection passage at a connection position where the connection passage is connected to the liquid storage portion, a length in a direction perpendicular to the axial direction between a surface of the diaphragm body opposite to the liquid storage portion and an inner surface of the liquid storage portion gradually decreases as it proceeds away from the connection position in an inclined region exceeding half of the liquid storage portion along the axial direction, wherein

a surface of the diaphragm body opposite to the liquid storage portion has a first surface located on a side away from the connection position in the axial direction, and a second surface located on a side closer to the connection position in the axial direction with respect to the first surface and inclined with respect to the first surface,

a length of the first surface along the axial direction is longer than a length of the second surface along the axial direction,

the first surface is inclined with respect to the axial direction toward a side away from the inner surface of the liquid storage portion as it approaches the connection position in the axial direction, and

an inclination angle of the first surface with respect to the axial direction is larger than an inclination angle of the second surface with respect to the axial direction.

2. The access port according to claim 1, wherein

the port body includes a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that forms a side surface of the liquid storage portion,

the side wall portion includes a protruding portion provided to be spaced apart from the bottom wall portion and having a facing guide surface facing the bottom surface, and

the connection passage opens to the side surface at a position between

the facing guide surface and the bottom surface.

3. The access port according to claim 2, wherein the facing guide surface has a concave surface recessed away from the bottom surface at a central portion of the facing guide surface in a width direction perpendicular to both the axial direction and a direction in which the facing guide surface faces the bottom surface.

4. The access port according to any one of claims 1 to 3, wherein

the port body includes a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that extends from the bottom wall portion to form a side surface of the liquid storage portion,

the side wall portion includes a pair of flat wall portions arranged side by side in a circumferential direction of the side wall portion,

the connection passage opens to the side surface at a position between the pair of flat wall portions, and

the bottom wall portion includes a guide rib extending linearly toward the connection position when observed from a direction parallel to a direction in which the side wall portion extends from the bottom wall portion.

5. The access port according to any one of claims 1 to 4, wherein

the port body includes a surface layer member that forms an inner surface of the liquid storage portion and the connection passage, and

the surface layer member connects the inner surface of the liquid storage portion and the connection passage seamlessly.

6. The access port according to any one of claims 1 to 5, wherein, in a cross-section perpendicular to the axial direction of the connection passage, an inner surface of the port body is inclined with respect to a lower surface of the diaphragm body facing the inner surface of the port body so as to approach the diaphragm body on both outer sides in a direction along the lower surface.

7. The access port according to claim 6, wherein the inner surface extends in a U-shape in the cross-section perpendicular to the axial direction of the connection passage.

8. The access port according to any one of claims 1 to 7, wherein the port body has a built-in metal coil.

9. The access port according to any one of claims 1 to 8, wherein the port body includes at least two metal coils provided to be spaced apart from each other at positions around the liquid storage portion, and at least two light emitters electrically connected to the metal coils.

10. The access port according to claim 9, wherein

the port body includes a bottom wall portion that forms a bottom surface of the liquid storage portion and a side wall portion that forms a side surface of the liquid storage portion, and

the at least two metal coils are incorporated in the side wall portion.