BODY POSITION FIXING DEVICE FOR MICROVASCULAR DECOMPRESSION SURGERY

Field of the Invention

The present invention relates to a medical device, and in particular to a body position fixing device for microvascular decompression surgery.

Background to the Invention

Common cranial nerve diseases include hemifacial spasm, trigeminal neuralgia, and glossopharyngeal neuralgia. Although they generally do not endanger patients' lives, they seriously affect patients' quality of life. For example, hemifacial spasm, a cranial nerve disease characterized by intermittent and clonic twitching of facial muscles on one side, often reduces patients' quality of life. Trigeminal neuralgia, a cranial nerve disease manifested as recurrent, sudden-onset and sudden-termination lightning-like severe facial pain, may cause patients to suffer from unbearable pain, difficulty in eating, and limited daily activities. The pathogenesis of cranial nerve diseases is mainly that the persistent compression of the responsible artery leads to nerve demyelination. Microvascular decompression surgery is a safe and effective method for treating cranial nerve diseases.

The principle of microvascular decompression surgery is to open a small bony window behind the ear to expose the nerves and blood vessels at the cerebellopontine angle. Then, the responsible blood vessels causing the symptoms are identified, separated from the nerves, and isolators such as special cotton are placed between them to reduce or eliminate the compression of blood vessels on the nerves, thereby achieving the purpose of cure. Some patients may also eliminate the hypertensive state caused by vascular compression of the brainstem through this surgery, achieving the goal of curing hypertension. Its long-term complications are rare, but short-term complications include common symptoms after posterior fossa surgery such as dizziness, headache, nausea, and vomiting. Some patients may also experience cranial nerve-related symptoms such as facial paralysis, diplopia, and dysphagia.

Microvascular decompression surgery requires the patient to be in a lateral position, with the head lowered and neck muscles stretched to expose the surgical area behind the ear. Therefore, how to better fix the patient on the operating table and better expose the surgical area is crucial. The existing surgical fixation devices mainly have the following problems:

the head support effect is limited. Prolonged compression of facial muscles during surgery is likely to cause discomfort to the face, and may even compress or irritate the nerves, leading to abnormal nerve function, which affects the surgical process and effect;

the adjustment adaptability of conventional head support and fixation devices is limited, making it difficult to accurately adjust the fixed support points according to different patients.

The publication (announcement) number (CN 113041086 B) discloses a microvascular decompression device for hemifacial spasm and other cranial nerve disorders, which includes a movable platen and a fixing frame vertically fixed on the movable platen. A fixing ring is mounted in the fixing frame via bolts, and a constraint assembly for fixing the patient’s head is arranged on the fixing ring. Among them, a driving mechanism connected to the constraint assembly is arranged under the movable platen, and the driving mechanism includes a self-locking transmission structure and a rotating structure connecting the self-locking transmission structure and the constraint assembly; the adjusting structure drives the movable platen, the constraint assembly and the driving mechanism arranged thereon to swing, to adjust the patient’s head to a proper position for surgery. After adjustment, the self-locking transmission structure drives the rotating structure to rotate, and finally the rotating structure drives the constraint assembly to act to fix the patient’s skull, preventing the patient from trembling during the operation, and the self-locking transmission structure may ensure that the clamping force of the constraint assembly does not loosen.

However, the structure for fixing the patient’s head in this application is a fixing ring, and the constraint assemblies on the fixing ring are distributed in a ring around the fixing ring. However, the various regions of the human head and face are not the same. Some parts are slightly concave, such as the chin and forehead, and some parts are slightly protruding, such as the zygomatic bone. Therefore, when the constraint assemblies of this application fix the patient’s head and face, they may not perform targeted fixation on different regions of the patient’s head and face, resulting in relatively poor fixation effect.

Statement of Invention

In view of the above-mentioned existing problems, the present invention aims to provide a body position fixing device for microvascular decompression surgery. A head fixing component is arranged in the body position fixing device, and by targeted arrangement of corresponding fixing structures at different parts of the head and facial regions, the head fixing component of the present invention achieves a better fixing effect on the head.

The main idea of the technical solutions adopted by the present invention is as follows. Due to the limited effect of the current surgical fixing devices in supporting the head, long-term compression of facial muscles during the operation may cause compression or irritation to nerves, leading to abnormal nerve function and affecting the surgical process and effect.

Moreover, because microvascular decompression surgery is performed behind the ear, conventional operating tables and fixing devices make it impossible for patients to obtain a good surgical body position. Patients may only rotate their heads at a certain angle, which forms torsion between the body and the head, causing discomfort to patients and easily damaging neck tissues and muscles.

Conventional head support and fixing devices have limited adjustment adaptability, making it difficult to accurately adjust the fixed support points according to different patients.

Therefore, according to the actual use requirements and functional analysis in the surgical operation process, the present invention designs a fixing device with better supporting and fixing effects for use in microvascular decompression surgery, which may also promote the development of auxiliary equipment and technologies for microvascular decompression surgery.

First of all, the present invention improves the supporting bed plate by designing it into an arc shape, which may well place the patient in the supporting bed plate, prevent the patient from falling off from it, and may well protect the patient’s safety. In addition, because microvascular decompression surgery is performed behind the ear, conventional operating tables and fixing devices make it impossible for patients to obtain a good surgical body position. Patients may only rotate their heads at a certain angle, which forms torsion between the body and the head and causes discomfort to patients. Therefore, the present invention also arranges an angle adjustment structure between the bed frame and the supporting bed plate, which may drive the body and the head to rotate together, making patients feel comfortable.

In order to stably fix and support the patient’s head during the operation, provide a stable operating platform and a good surgical field of view for the operation, and avoid damaging the patient’s neck and head blood circulation, the present invention further arranges a head support structure at an end of the supporting bed plate. The head support structure includes a facial support component capable of supporting the face and a head fixing component capable of fixing the head.

In order to achieve the above-mentioned purpose, the technical solutions adopted by the present invention are as follows.

A body position fixing device for microvascular decompression surgery includes a bed frame and a body position fixing device for microvascular decompression surgery located above the bed frame.

The body position fixing device includes a supporting bed plate located above the bed frame, and a head support structure arranged at a front end of the supporting bed plate.

An angle adjustment structure is arranged between the bed frame and the supporting bed plate.

The head support structure includes a connecting base connected to the supporting bed plate, a support base located above the connecting base and connected to the connecting base, a facial support component located above the support base and connected to the support base, and a head fixing component connected to the facial support component.

Further, the head fixing component includes a lead screw connected to a bottom of the support base, and a connecting rod assembly movably connected to the lead screw.

Further, the connecting rod assembly includes a first connecting rod movably sleeved on one end of the lead screw for fixing the chin, and a second connecting rod movably sleeved on the other end of the lead screw for fixing the top of the head.

Further, the first connecting rod includes a first sliding sleeve sleeved on the lead screw, a short rod movably connected to the first sliding sleeve, and a chin fixing block assembly movably connected to the short rod.

Further, the second connecting rod includes a second sliding sleeve movably sleeved on the lead screw, a long rod movably connected to the second sliding sleeve, and a top-of-the-head fixing block assembly movably connected to the long rod.

Further, the facial support component includes a zygomatic support assembly located above the support base and connected to the support base, and a forehead support assembly located in front of the zygomatic support assembly.

Further, the zygomatic support assembly includes zygomatic support blocks and rotary support members located below the zygomatic support blocks.

Further, the forehead support assembly includes a forehead support block and a sliding fixing member located below the forehead support block.

Further, the sliding fixing member includes two square blocks symmetrically arranged below the forehead support block, sliding grooves are disposed in the square blocks, two support rods are symmetrically arranged below the forehead support block, a sphere is connected to an end of each support rod, and each sphere is sleeved in the sliding groove.

Further, the angle adjustment structure includes a pushing assembly located on a side of the bed frame and connected to the supporting bed plate, and a rotary support assembly located in a middle of the bed frame and connected to the supporting bed plate.

The beneficial advantage of the present invention is that, compared with the prior art, the improvements of the present invention are as follows.

By carrying out targeted arrangement of corresponding fixing structures at different parts of the patient's head and face, such as the zygomatic bone, chin, forehead, top of the head and other parts, the head fixing component of the present invention has a better fixing effect on the head.

In an angle adjustment structure, an electric push rod is hingedly arranged on a side of the bed frame and the supporting bed plate, and a rotation support assembly is hingedly connected between the bed frame and the supporting bed plate. By controlling the lifting of the electric push rod to push the supporting bed plate to rotate, the adjustment of the angle of the supporting bed plate is more stable and smoother, and the patient will not feel uncomfortable on the supporting bed plate.

Both the top-of-the-head fixing block assembly and the chin fixing block assembly are sleeved on different ends of the same lead screw through sliding sleeves. The rotation of the lead screw realizes the linkage of the top-of-the-head fixing block assembly and the chin fixing block assembly, so that the patient's head may be better fixed under the dual fixation of the top-of-the-head fixing block assembly and the chin fixing block assembly, and the progress and state of the doctor's operation on the patient will not be affected.

Two support rods are integrally formed below the forehead support block of the present invention, the ends of the support rods are both connected to spheres, and the spheres are located in the sliding grooves. In the uncompressed state, the spheres may slide in the sliding grooves, so that the forehead support block may be quickly adjusted to the position suitable for the foreheads of different patients. After moving to a proper position, under the weight of the patient's own head, the spheres are deformed in the sliding grooves, the spheres shrink in the height direction and expand in the horizontal direction, and quickly squeeze inner walls of the sliding grooves to form positioning. There is no need to add other positioning methods, which is convenient for patients to use. Through the combination of the above spheres and sliding grooves, a sliding structure may realize two functions, which may not only realize sliding, but also realize the fixing effect in the sliding grooves at the same time.

Brief Description of the Drawings

FIG. 1 is a three-dimensional schematic diagram of an overall structure of a body position fixing device of the present invention;

FIG. 2 is a front view of the overall structure of the body position fixing device of the present invention;

FIG. 3 is a structural schematic diagram of a bed frame and a supporting bed plate of the body position fixing device of the present invention;

FIG. 4 is a side view of the bed frame and the supporting bed plate of the body position fixing device of the present invention;

FIG. 5 is a structural schematic diagram of a facial support component of the body position fixing device of the present invention;

FIG. 6 is a side view of the facial support component of the body position fixing device of the present invention;

FIG. 7 is a cross-sectional view along the A-A direction of the side view of the facial support component of the present invention;

FIG. 8 is a top view of the facial support component of the body position fixing device of the present invention;

FIG. 9 is a structural schematic diagram of a head fixing component of the body position fixing device of the present invention;

FIG. 10 is a structural schematic diagram of the head fixing component with a supporting plate removed of the body position fixing device of the present invention;

FIG. 11 is a bottom perspective structural schematic diagram of the head fixing component of the body position fixing device of the present invention;

FIG. 12 is a side view of the head fixing component of the body position fixing device of the present invention;

FIG. 13 is a cross-sectional view along the B-B direction of the side view of the head fixing component of the present invention;

FIG. 14 is a side view of a forehead support assembly of the body position fixing device of the present invention;

FIG. 15 is a cross-sectional view along the A-A direction of the side view of the forehead support assembly of the present invention; and

FIG. 16 is an enlarged schematic diagram of part A of the present invention.

Reference numerals and denotations thereof: 1-bed frame; 2-supporting bed plate; 3-connecting base; 4-supporting plate; 5-lead screw; 6-handwheel; 7-vertical rod; 8-strut; 9-long rod; 10-top-of-the-head fixing block; 11-pusher; 12-fixing block; 13-T-shaped block; 14-connecting shaft; 15-horizontal rod; 16-forehead support block; 17-zygomatic support block; 18-ball seat; 19-square block; 20-sphere; 21-chin fixing block; 22-short rod; 23-sliding groove; 24-first sliding sleeve; 25-support rod; and 26-second sliding sleeve.

Detailed Description

In order to enable those of ordinary skill in the art to better understand the technical solutions of the present invention, the technical solutions of the present invention will be further described below in conjunction with the accompanying figures and examples.

Common cranial nerve diseases include hemifacial spasm, trigeminal neuralgia, and glossopharyngeal neuralgia. Although they generally do not endanger patients' lives, they seriously affect patients' quality of life. For example, hemifacial spasm, also known as facial twitch, is a disorder characterized by involuntary twitching on one side of the face. Its main manifestations include intermittent, involuntary, clonic twitching or painless rigidity of the facial muscles on one side. This twitching is paroxysmal and irregular, varying in severity, and may be exacerbated by factors including fatigue, mental stress, and voluntary movements.

Microvascular decompression is a minimally invasive surgical procedure used to treat compression of intracranial nerves by blood vessels, primarily for conditions such as trigeminal neuralgia and hemifacial spasm. The principle of microvascular decompression surgery is to open a small bony window behind the ear to expose the nerves and blood vessels at the cerebellopontine angle. Then, the responsible blood vessels causing the symptoms are identified, separated from the nerves, and isolators such as special cotton are placed between them to reduce or eliminate the compression of blood vessels on the nerves, thereby achieving the purpose of cure. Some patients may also eliminate the hypertensive state caused by vascular compression of the brainstem through this surgery, achieving the goal of curing hypertension. Its long-term complications are rare, but short-term complications include common symptoms after posterior fossa surgery such as dizziness, headache, nausea, and vomiting. Some patients may also experience cranial nerve-related symptoms such as facial paralysis, diplopia, and dysphagia.

The existing surgical fixation devices mainly have the following problems:

the head support effect is limited. Prolonged compression of facial muscles during surgery is likely to cause discomfort to the face, and may even compress or irritate the nerves, leading to abnormal nerve function, which affects the surgical process and effect;

since microvascular decompression surgery is performed behind the ear, conventional operating tables and fixation devices fail to provide optimal surgical positioning for patients; instead, patients' heads must be rotated to a certain angle, creating torsion between the body and the head; this not only causes discomfort but also risks damaging neck tissues and muscles;

the adjustment adaptability of conventional head support and fixation devices is limited, making it difficult to accurately adjust the fixed support points according to different patients.

Therefore, based on the actual requirements and functional analysis of the surgical procedure, the present invention designs a body position fixing device for microvascular decompression surgery. By carrying out targeted arrangement of corresponding fixing structures at different parts of the patient's head and face, such as the zygomatic bone, chin, forehead, top of the head and other parts, the head fixing component of the present invention has a better fixing effect on the head, which may also promote the development of auxiliary equipment and technologies for microvascular decompression surgery.

For the specific structure of the body position fixing device for microvascular decompression surgery in the present invention, please refer to FIGS. 1-16. A body position fixing device for microvascular decompression surgery includes a bed frame 1 and a body position fixing device for microvascular decompression surgery located above the bed frame 1. The body position fixing device includes a supporting bed plate 2 located above the bed frame 1, and a head support structure arranged at a front end of the supporting bed plate 2.

Since microvascular decompression surgery applicable to cranial nerve diseases is performed behind the ear, conventional operating tables and fixing devices fail to provide patients with a good surgical position. Patients may only rotate their heads at a certain angle, resulting in torsion between the body and the head, which causes discomfort to patients and easily damages neck tissues and muscles. Therefore, the supporting bed plate 2 of the present invention is of an arc-shaped structure, and one or more layers of soft pads may be laid on the supporting bed plate 2 according to the needs of patients, so that patients may lie prone on the supporting bed plate 2 comfortably for subsequent surgeries. The arc-shaped supporting bed plate 2 may also prevent patients from falling off, which may well protect the safety of patients.

In order to establish a mechanism for adjustable rotation of the body and head together, an angle adjustment structure is arranged between the bed frame 1 and the supporting bed plate 2 in the present invention. Since the supporting bed plate 2 is fixed together with the connecting base 3, the angle adjustment structure of the present invention may drive the supporting bed plate 2 and the connecting base 3 to rotate together. Moreover, since the body is located on the supporting bed plate 2 and the head is located on the connecting base 3, when the supporting bed plate 2 and the connecting base 3 rotate together, they may drive the body and the head to rotate together.

More specifically, the angle adjustment structure includes a pushing assembly located on a side of the bed frame 1 and hingedly connected to the supporting bed plate 2, and a rotary support assembly located in a middle of the bed frame 1 and hingedly connected to the supporting bed plate 2.

The pushing assembly includes a pusher 11 hingedly connected to the bed frame 1, where the pusher 11 is an electric push rod, and a connecting rod protruding from the supporting bed plate and hingedly connected to the electric push rod. It is to be noted that a connecting block with an opening in the middle is arranged at a bottom of the electric cylinder push rod, and a fixing block 12 with an opening matching the connecting block is also arranged at a corresponding position on the bed frame. A pin shaft is inserted through the corresponding openings of the connecting block and the fixing block 12, so that the electric push rod may push the supporting bed plate 2 to rotate. A top of the electric push rod is hingedly connected to the supporting bed plate 2.

The angle adjustment structure further includes a rotary support assembly, and the rotary support assembly is located right in a middle of the bed frame 1 and is hingedly connected to a protruding T-shaped block 13 of the supporting bed plate 2. The rotary support assembly is arranged to cooperate with the pushing assembly, so that the angle adjustment structure may adjust the angle of the supporting bed plate 2 more stably and smoothly without causing discomfort to patients on the supporting bed plate 2.

Through the hinged connection between the top and a bottom of the electric push rod, the lifting of the electric push rod is controlled to drive the supporting bed plate 2 to change its angle, to change the angle between the patient’s body and the surgical position of the head. Then, through the head support structure, the patient’s head is stably fixed and supported, providing a stable operating platform and a good surgical field of view for the surgery, and avoiding damage to the patient’s neck and head blood circulation.

The head support structure includes a connecting base 3 welded and connected to the supporting bed plate 2, a support base located above the connecting base 3 and connected to the connecting base 3, a facial support component located above the support base and connected to the support base, and a head fixing component connected to the facial support component. The function of the connecting base is to connect the support base with the supporting bed plate 2 and support the support base.

The head fixing component includes a lead screw 5 connected to a bottom of the support base, a handwheel 6 located at an end of the lead screw 5, and a connecting rod assembly movably connected to the lead screw 5. The lead screw 5 penetrates through the connecting base 3 and the support base. It is to be noted that the connecting base 3 is an A-shaped connecting base with a horizontal rod 15 in a middle, and the support base includes a supporting plate 4 and a vertical rod 7 located on a side of the supporting plate 4. The vertical rod 7 is perpendicular to the supporting plate 4 and integrally formed with the supporting plate 4. The other end of the lead screw 5 is inserted into the horizontal rod 15.

More specifically, a slot is further disposed through the vertical rod 7, and a top end of the vertical rod 7 is hingedly connected to the second strut 8.

The connecting rod assembly includes a first connecting rod movably sleeved on one end of the lead screw 5 for fixing the chin, and a second connecting rod movably sleeved on the other end of the lead screw 5 for fixing the top of the head.

The first connecting rod includes a first sliding sleeve 24 sleeved on the lead screw 5, a short rod 22 hingedly connected to the first sliding sleeve 24, and a chin fixing block assembly movably connected to the short rod 22. The first sliding sleeve 24 may move back and forth on the lead screw 5 along the direction of the lead screw 5. It is to be noted that the chin fixing block assembly includes a chin fixing block 21 and a connecting rod integrally formed with the chin fixing block 21. The connecting rod is hingedly connected to the horizontal rod 15 of the connecting base 3, and the connecting rod is also hingedly connected to the short rod 22.

The second connecting rod includes a second sliding sleeve 26 movably sleeved on the lead screw, a long rod 9 movably connected to the second sliding sleeve 26, and a top-of-the-head fixing block assembly movably connected to the long rod 9. Similarly to the chin fixing block assembly, the top-of-the-head fixing block assembly also includes a top-of-the-head fixing block 10 and a strut 8 integrally formed with the top-of-the-head fixing block 10. The strut 8 is hingedly connected to the vertical rod 7, and the strut 8 is also hingedly connected to the long rod 9.

In use, by rotating the handwheel 6 clockwise or counterclockwise, the handwheel 6 drives the lead screw 5 to rotate. Since a nut is arranged at one end of the lead screw 5 and a handwheel is arranged at the other end, the lead screw 5 is limited in position, so that the lead screw 5 may only rotate in place and may not move. Therefore, when the lead screw 5 rotates, it will drive the first sliding sleeve 24 and the second sliding sleeve 26, which are sleeved on the lead screw 5 and threadedly connected to the lead screw 5, to translate leftward or rightward on the lead screw 5. Here, the case where the handwheel 6 rotates clockwise is taken as an example. When the handwheel 6 rotates clockwise, it drives the lead screw 5 to rotate clockwise, and then the lead screw 5 drives the first sliding sleeve 24 and the second sliding sleeve 26 to translate rightward on the lead screw 5. First, the second sliding sleeve 26 is described. When the second sliding sleeve 26 translates rightward, the long rod 9 hingedly connected to the second sliding sleeve 26 will move along with the rightward translation of the second sliding sleeve 26. Since the long rod 9 is hingedly connected to the strut 8 and the strut 8 is hingedly connected to the vertical rod 7, as the long rod 9 translates rightward, the strut 8 hingedly connected to the vertical rod 7 will rotate downward with the hinge point as the fulcrum. Since the strut 8 and the top-of-the-head fixing block 10 are integrally formed, the top-of-the-head fixing block 10 will also rotate downward along with the strut 8 until it contacts the top of the head and may effectively fix the top of the head.

Similarly to the movement principle of the second sliding sleeve 26, when the handwheel 6 rotates clockwise, it drives the lead screw 5 to rotate clockwise, and then the lead screw 5 drives the first sliding sleeve 24 to translate rightward. When the first sliding sleeve 24 translates rightward, since the first sliding sleeve 24 is hingedly connected to one end of the short rod 22, a rod perpendicular to the connecting rod extends from the connecting rod integrally formed with the chin fixing block 21, the rod is hingedly connected to the other end of the short rod 22, and the connecting rod is hingedly connected to the horizontal rod 15 of the connecting base 3, the short rod hingedly connected to the first sliding sleeve 24 will drive the connecting rod to rotate upward on the horizontal rod 15 when the first sliding sleeve 24 translates rightward, and then drive the chin fixing block 21 to rotate upward until it contacts the chin and may effectively fix the chin.

When it is necessary to release the fixation of the top of the head and the chin, it is only necessary to rotate the handwheel counterclockwise. The movement principle is the same as that of the fixation mode, and the movement direction is opposite to that of the fixation mode, which will not be repeated here.

In order to avoid long-term compression of facial muscles by conventional facial support components, the facial support component of the present invention includes a zygomatic support assembly located above the support base and connected to the support base, and a forehead support assembly located in front of the zygomatic support assembly. The forehead support assembly includes a forehead support block 16 and a sliding fixing member located below the forehead support block 16. It is to be noted that the forehead support block 16 is made of an elastic and flexible material, such as rubber, silicone, etc. The sliding fixing member includes two square blocks 19 symmetrically arranged below the forehead support block 16. Sliding grooves 23 are disposed in the square blocks 19. Two support rods 25 are integrally formed below the forehead support block 16. The support rods 25 are made of a relatively hard material, such as high-density polyethylene material, which may support the forehead support block. Ends of the two support rods 25 are connected with spheres 20, the spheres 20 are made of an elastic and flexible material, and the two spheres 20 are respectively located in the sliding grooves 23 of the two square blocks 19.

When the patient’s forehead is placed on the forehead support block 16, the forehead support block 16 may first be adjusted according to the position of the patient’s forehead. After being adjusted to a position matching the patient’s forehead, the patient’s own head weight may position the forehead support block 16, making it more convenient to use.

The zygomatic support assembly includes a rotary support member located on the support base and connected to the support base, and zygomatic support blocks 17 located above the support member. The zygomatic support blocks 17 are also made of an elastic and flexible material. Bottoms of the extension rods integrally formed with the zygomatic support blocks 17 are spherical, which just forms a spherical hinge structure with ball seats 18 having grooves adapted to the spherical shape. The working principle of the spherical hinge structure is the prior art, which will not be repeated here. The formed spherical hinge structure enables the zygomatic support blocks 17 to rotate 360° on the ball seats 18 without falling off the ball seats 18.

Example 1

Common cranial nerve diseases include hemifacial spasm, trigeminal neuralgia, and glossopharyngeal neuralgia. Although they generally do not endanger the patient's life, they seriously affect the patient's quality of life. The pathogenesis of cranial nerve diseases is mainly that the responsible artery continuously compresses the nerve, leading to nerve demyelination. Microvascular decompression surgery is a safe and effective method for treating cranial nerve diseases.

When using the body position fixing device of the present invention to perform microvascular decompression surgery on patients with cranial nerve diseases, first, one or more layers of soft pads may be laid on the supporting bed plate 2 according to the needs of the patient, and then the patient in need of microvascular decompression surgery is allowed to lie prone on the supporting bed plate 2. Then, different areas of the patient's face are attached to the corresponding support components, so that the patient's forehead is placed on the forehead support block 16, and the zygomatic bones are placed on the zygomatic support blocks 17.

After the patient's forehead and zygomatic bones are fixed, the doctor may manually rotate the handwheel 6 clockwise to drive the lead screw 5 to rotate. When the lead screw 5 rotates, the chin fixing block 21 rotates upward and tightens, and the top-of-the-head fixing block 10 presses downward. The linkage of the top-of-the-head fixing block 10 and the chin fixing block 21 is realized through one lead screw 5, to quickly clamp and fix the head.

After the patient's head and face are fixed, the doctor may adjust the angle of the supporting bed plate 2 according to the needs of the surgery. During adjustment, the patient's position may be adjusted according to the needs of microvascular decompression surgery, for example, the patient may be adjusted to a lateral position to expose the surgical area behind the ear. The switch of the electric push rod may be pressed to make the electric push rod push the supporting bed plate 2 to rotate until the supporting bed plate 2 drives the patient to rotate to the angle required by the doctor, and then the switch may be turned off.

Since the supporting bed plate 2 of the present invention is fixed together with the connecting base 3, the angle adjustment structure of the present invention may drive the supporting bed plate 2 and the connecting base 3 to rotate together, so that the patient will not feel uncomfortable due to asynchronous rotation of the head and the body.

After the above preparations are completed, the doctor may perform microvascular decompression surgery on the patient.

Example 2

The usage method of this example is the same as that of Example 1. The only difference is that when the patient’s forehead is placed on the forehead support block 16, first, the forehead support block 16 may be adjusted according to the position of the patient’s forehead. During adjustment, the support rods 25 may be moved in the sliding grooves 23 to drive the forehead support block 16 to move. After the forehead support block 16 is under pressure, it squeezes the spheres 20, causing the spheres 20 to deform in the sliding grooves 23. The spheres 20 shrink in the height direction and expands in the horizontal direction, squeezing inner walls of the sliding grooves 23 to form positioning. There is no need to add other positioning methods, and the forehead support block 16 may be positioned only by relying on the patient’s own head weight, making it more convenient to use.

Example 3

The usage method of this example is the same as that of Example 1. The only difference is that when the patient’s zygomatic bones are placed on the zygomatic support blocks 17, the angle of the zygomatic support blocks 17 may be adjusted through the characteristic that the spherical hinge structure may rotate 360° until the zygomatic support blocks 17 are adapted to the patient’s zygomatic bones. This zygomatic support assembly with flexible and adjustable support positions may avoid long-term compression of facial muscles, and is also very convenient to use with simple operation.

The above shows and describes the basic principles, main features and advantages of the present invention. Those skilled in the art will understand that the present invention is not limited to the above-mentioned examples, and what is described in the above-mentioned examples and the specification only illustrates the principles of the present invention. Without departing from the spirit and scope of the present invention, the present invention will also have various changes and improvements, and all these changes and improvements fall within the scope of the present invention as claimed. The scope of protection claimed by the present invention is defined by the appended claims and their equivalents.