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# Clinical Research Based on Microscopy in Brainstem Tumor Treatment

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**Abstract**
Due to the poor tolerance of the brainstem to injury and the high risk of surgery, there may be important neurological dysfunction in any part of the brainstem. How to improve the success rate and prognosis of microsurgery remains to be further explored. The purpose of this article is to observe and analyze the application of micro-instruments in brain stem tumor treatment surgery, analyze the actual role of micro-instruments in clinical practice, and to compare the before and after micro-instruments in brain stem tumor surgery, The Clinical Path of Microdevices in Brain Stem Tumor Therapy. Using the method in this article, through the analysis of experimental data, we understand the role of microscopy equipment in the treatment of brainstem tumors, and found that different parts of brainstem space occupying lesions have different characteristics. Different surgical approaches should be adopted, and the application of microscopic instruments is closely related. The research results show that the application of micro-instruments in the treatment of brain stem tumors has a great effect on improving the surgical treatment of brain stem tumors.

**Key words:** Research in Microscopy, Brainstem Tumor, Surgical Treatment, Clinical Research

## 1. Introduction

Brain stem tumors originate from the tissue structure of the brain stem, which gradually oppresses or invades the brain stem as it develops, eventually leading to brain stem dysfunction and endangering patients' lives [1]. The brainstem has important functions such as movement and sensation. After the injury, there are serious consequences. There are 10 pairs of brain nerves in and out of the brainstem and there are many blood vessels around the brainstem. The entire brainstem is located deep in the posterior cranial fossa [2]. It is blocked by the slope and the top of the rock, and covered by the cerebellum. In addition, the cerebellum and the brain sickle strictly control this narrow space, and important sinuses are distributed in the cerebellum and the brain sickle. Surgery can only reach the pathological position of the brainstem through narrow channels, brainstem injury and high-risk operations [3].

Gliomas have the highest incidence among brainstem tumors, and the disease is usually chronic and progressive [4]. It can occur anywhere in the brainstem and develop in any direction. Brainstem gliomas can be divided into two types: diffuse brainstem gliomas (the most common pontine, most of which are high-fibrous astrocytomas) and focal brainstem gliomas (most of which Is located in the midbrain and medulla) [5]. Most patients with glioblastoma cystic disease have a short course of disease, while patients with parenchymal disease grow slowly and can remain stationary for several years. They can also suddenly develop disease due to tumor bleeding or cystic changes [6].

When the postoperative anesthesia is not clear, adopting a healthy side-lying position can prevent respiratory and circulation dysfunction caused by aspiration and brain stem displacement; identify problems and deal with them in a timely manner; maintain metabolism and acid-base balance of water and electrolytes in the body To ensure the body's nutritional supply, if the patient has difficulty swallowing, nasal feeding can be given; to ensure oxygen supply, such as insufficient ventilation, assist ventilation until effective breathing is restored; to prevent stress ulcers, especially after medullary tumors, acid suppression should be used regularly Agents and gastric mucosal protective agents; timely ventricular-peritoneal shunt for non-reactive obstructive hydrocephalus; exercise for nerve function recovery as soon as possible; for patients with limb dysfunction, care should be taken to prevent deep vein thrombosis and prevent lung Internal infections; for patients with dysuria and indwelling catheters, prevent lung infections, gastrointestinal bleeding, respiratory dysfunction, and hydrocephalus [7]. Radiotherapy is an important adjuvant therapy for brain stem tumors. Routine radiotherapy can extend the survival time of patients to a certain extent. With the emergence of stereotactic radiation therapy, more and more are being selected for the treatment of brain stem tumors, which is expected to become an important adjuvant treatment or alternative treatment method for surgical treatment. However, due to the lack of clinical application data, further summary and accumulation are needed [8].

This article uses the method of experimental research to understand the role of micro-instruments in brainstem tumor treatment surgery, and the comparative exploration before and after application; through theoretical analysis and experimental exploration, find out the micro-instruments in brainstem tumor treatment surgery. Role; processing data through data recording, sorting, calculation, mapping, analysis, simulation of clinical data related to clinical research in brainstem tumor surgery with micro-instruments, simulation of microdata, empirical analysis of microscopy combined with data The role of instrument in brainstem tumor treatment operation, combined with effective data, summarized and analyzed the role of micro instruments in brainstem tumor treatment operation. The results show that on the basis of correct selection of surgical indications, using rich microanatomical knowledge and superb surgical techniques, microsurgery on brain stem tumors has achieved satisfactory results.

## 2. Proposed Method

### *2.1. Brainstem Morphology*

In the brainstem, there is a network structure connecting the nucleus of the thirty-second pair of brain nerves and a multi-channel connection [9].The upper end of the brain stem is connected to the cerebral feet of the midbrain. The ventral side is broad and raised, called the base. The middle superficial sulcus is the image of the basilar artery. The lateral fiber bundles gather to the sides to form the central cerebellar foot. In the transition from the bridge bottom to the bridge wall, there is a trigeminal nerve root. There are abductor nerves, facial nerves and positional nerves from the middle to the lateral side of the pontine. The ventral side of the midbrain consists of a pair of cerebral feet consisting of a cone bundle. There is a sacral nerve groove on the inside, from which the sacral nerve exits the brain. There is a nest between the two feet of the brain. The skull base is the posterior perforating branch. Many perforators come from this brain. There is a thin bundle nucleus and a wedge bundle nucleus at the back of the brainstem. In the open section, the central tube of the spinal cord expands to the lower half of the bottom of the fourth ventricle. The posterior part of the pontine forms the upper half of the fourth ventricle. The transverse medulla at the bottom of the fourth ventricle is the boundary between the medulla oblongata and the pontine. The upper end of the longitudinal groove between the left and right hillocks contains the pineal gland. Below the inferior colliculus, the trochlear nerve passes through the midbrain, crosses left and right in the anterior medullary membrane, and then runs around the foot to the ventral surface. The deep part of the midbrain roof is the covered part, in which the brain aqueduct is connected up and down with the third and fourth ventricles, respectively. The internal structure of the brainstem includes scattered gray matter nuclei and white matter fibers. There are some relay nuclei in the gray matter nucleus, such as femur, wedge, substantia nigra, red nucleus, etc., which participate in the fiber connections of the spinal cord, cerebellum, mesencephalon, and striatum. The white matter of the brainstem is mainly distributed on both sides of the brainstem and around the middle seam, and the relay conduction beam at the middle seam first passes in the opposite direction and then upwards [10].

Patients with cough and dysphagia provide nutritional support and symptomatic treatment [11]. Patients with respiratory dysfunction before surgery should improve respiratory function. For patients with pulmonary infection before surgery, choose sensitive antibiotics, adjust blood pressure, control blood sugar levels, and then perform surgical treatment when the situation allows. The incidence of postoperative complications of brain stem and peri-brain stem tumors is high, and the severity of complications varies widely.

*2.2. Clinical Manifestations of Brain Stem Tumors*

The brain stem has complex anatomy and physiological functions. The clinical symptoms and signs caused by brainstem lesions are complex and diverse. Some patients only have symptoms such as dizziness and headache, and some patients show typical cranial nerve disorders, cross paralysis, and ataxia. In addition, it can also show specific signs of the brainstem, such as midbrain red nucleus tremor, paroxysmal coma (disorder of consciousness); gaze pontine palsy in the same direction, dysuria; medulla oblongata can cause breathing difficulties, blood pressure, heart rate changes, stubborn Hiccups, gastrointestinal bleeding, etc. If the above-mentioned typical symptoms and signs appear, it is easy to think of brain stem disease, but if the symptoms are not typical, especially in the early stages of the disease, it is difficult to distinguish it from other parts of the central nervous system. For example, simple dizziness is difficult to be considered as a brainstem tumor, cranial nerve symptoms are often suspected to be caused by diseases other than the peripheral nerve or brainstem, occipital pain is often misdiagnosed as cervical spondylopathy, and ataxia is mostly considered as cerebellar disease. When there are typical symptoms and signs, the emphasis is often great, the treatment is difficult, and the best opportunity for treatment is often lost. Here, we emphasize the importance of early symptomatic characteristics and early diagnosis. In order to achieve early diagnosis, the key is to consider the diversity of brain stem lesions, conduct imaging examinations in time, and make a clear diagnosis as soon as possible. Brainstem gliomas are often chronic and progressively worse. They are more common in children and adolescents. In whole brain angiography, glioblastoma may have tumor staining, but it is only a small part of the tumor, the staining is shallow, and the donor artery is rarely dilated.

Brainstem injuries can be divided into unilateral injuries and bilateral diffuse injuries. In the past, ipsilateral peripheral neuropathy, limb paralysis, and contralateral muscle tension have often occurred. When bilateral diffuse lesions occur, the brainstem reticular structure, that is, the ascending reticular activation system of the brainstem, is damaged, causing changes in consciousness, emotion, memory, intelligence, and personality. Medial thalamus injury, contraceptive deep sensory disturbance.

In addition, pregnant women may develop symptoms or aggravation of the disease, and the clinical manifestations of the disease are closely related to pathological typing. The pathological types of the disease are: capillary type. Under the microscope, vascular endothelial cells and surrounding cell areas are rich in reticular fibers, and the incidence of the disease has been increasing in recent years. The disease can occur at any age, and there is no significant difference between men and women. Middle-aged and elderly are prone to occur, the lesions can be single or multiple, tumors have no envelope, rich blood circulation, cyst formation, tumor necrosis and subendothelial infiltration are rare. Lymphoma cells may invade the walls of blood vessels, much like vasculitis. Intracranial metastases are caused by distant metastases from malignant tumors in other parts of the body.

*2.3. Surgical Treatment*

Surgical approaches and indications include: suboccipital median approach: applicable to pontine, dorsal medulla, and distal aqueduct tumors. During the operation, the cerebellar vermicompost was elevated, and the fourth ventricle and pith were visible. Above the medulla is the pontine, and below the medulla is the medulla. The medulla is separated by the cerebellar medulla. The cerebellar vermiform does not need to be removed, and the obvious separation of the arachnoid and choroid attachment points can reveal the bridge arm and the lower mouth of the aqueduct. Brainstem tumors are mostly located on the dorsal side of the pons and medulla oblongata, which is one of the most widely used clinical operations. This method is used in most cases. It is also known as the cerebellar fissure approach. Cerebellar medullary fissure is a physiological fissure between the cerebellum and the medullary bulb. There is a choroid in the lower half of the space and a medullary membrane in the upper half, which together form part of the top of the fourth ventricle. The choroid and inferior medullary membrane are non-vascular membrane structures. Therefore, by dissecting this physiological space, it is possible to avoid damaging the brain tissue and blood vessels, exposing the tumors in the entire four ventricles and the dorsal lateral process of the brain stem. Suboccipital approach: Applicable to tumors in the mid-cap, upper pontine, and tumors in or near the aqueduct. The occipital lobe is raised near the midline and slowly enters from the top to the front of the curtain until it reaches the curtain groove. The sickle and straight sinuses are exposed on the inside of the veil. The front of the straight sinus is connected to the large veins of the brain. For tumors in the aqueduct and its proximal part, four bodies need to be excised. Suboccipital approach: Applicable to tumors on the midbrain side and on the upper side of the pontine. Raise the midline of the temporal occipital lobe to reach the free edge of the curtain, revealing the curtain. The inside of the free edge of the tentacle is the outer edge of the midbrain. Open the free margin of the cerebellum, the lower half is the upper half of the pontine. External fissure approach: Applies to lesions on the inner side of the midbrain or on the inner side of one foot of the brain. Separate the external fissure arachnoid membrane to the internal carotid artery, taking care not to damage the external fissure vein, and look backwards along the posterior communication branch of the internal carotid artery or the oculomotor nerve, that is, the foot pool, cerebral foot, basilar artery and its branches. Suboccipital posterior sigmoid sinus approach: applicable to pontine and anterior medulla. When the cerebellar hemisphere is pulled to the midline and rear, the pons and medulla are exposed. The function of the brainstem should be protected as much as possible.

Surgery should be smooth, accurate, and portable, keep the surgical vision clear, and avoid pulling and squeezing the brain stem. The excision of exogenous brainstem tumors should start from the outside of the brainstem. After distinguishing the interface between the brainstem and the brainstem, the resection is performed along the surface of the brainstem to the inside of the brainstem strictly. For endogenous tumors, the location of the tumor should be determined based on MRI manifestations. When resecting hemangioblastoma, it is forbidden to perform resection or biopsy of the tumor to prevent major bleeding and difficult to control. The resection method of solid hemangioblastoma is the same as that of cerebral arteriovenous malformation, that is, the blood supply artery is removed first, then the tumor is removed, and finally the draining vein is removed. During the operation, the blood-supplying artery should be found along the tumor surface, usually located deep in the tumor. After confirming the diagnosis, the blood-supplying arteries were cut off in turn, the veins were cauterized and removed. In order to reduce intraoperative bleeding and promote tumor resection, 1-2 days before operation, embolization of the blood-supplying arteries can be an important auxiliary method for resection of large solid tumors. For cystic hemangioblastoma, first remove the cyst wall, aspirate the cyst fluid, and look for nodules carefully. In the resection of astrocytomas, for the more limited tumors, after distinguishing the interface between the tumor and the brainstem, it is strictly separated from the brainstem along the tumor surface, and the total resection is as far as possible under the microscope. In this case, in order to avoid damaging the normal tissues of the brainstem and to remove the tumor as much as possible, the tumor should be sucked out of the tumor first, and then gradually sucked into the surroundings. If the boundary of the tumor can be identified, it can be separated from here, and the tumor is excised along the boundary. Care should be taken to remove astrocytomas with unclear borders to avoid respiratory dysfunction, because respiratory-related neurons or conduction beams may be mixed with the tumor. If the tumor is tightly attached to the brainstem, it cannot be forcibly removed to avoid life-threatening.

If the tumor involves the medulla oblongata or the medulla oblongata and the neck, surgery requires a gentle, stable, and strict sharp separation along the soft edema and glial degeneration layers around the tumor. First, the back and sides of the tumor were separated. There are often cysts at both ends of the tumor, which may be part of the tumor and should be removed at the same time. The posterior inferior artery and its branches, especially the small perforating artery of the posterior inferior cerebellar artery supplying the brainstem, should not be damaged to avoid brainstem ischemia and infarction. In addition, for brain stem tumor surgery, try to be as far as possible without traction, use hemostatic materials as much as possible to stop bleeding, if necessary, use low-power bipolar electrocoagulation to stop bleeding, and repeatedly rinse with normal saline to cool. If surgical conditions permit, intraoperative electrophysiological monitoring is recommended.

## 3. Experiments

### *3.1. Subject*

There were 15 patients with brain stem tumors in this group, 8 with male patients and 6 with female patients. The average age was 40.5 years, and the course of disease was 1-35 months. All organ functions of the patient were normal, and the daily activities before the illness were normal or nearly normal; the case data were authentic and reliable, the patient information was complete, and the imaging data were complete; all MRI examinations were performed before surgery, and the tumor was in the brainstem, the brainstem was compressed and clinical symptom. Patients are informed of the risks of surgery before surgery. Patients and their families are willing to undergo surgery and can tolerate surgery. The application of real-time monitoring during the operation can provide the operator with information on brain stem function status in time, guide the operation direction and tumor resection range, reduce or avoid brain stem function damage, and provide objective indicators for prognosis prediction. If abnormal changes in monitoring evoked potential or slow breathing, increased blood pressure, decreased heart rate, etc. are monitored during surgery, surgery should be stopped immediately, and surgery should be continued after recovery. Stability: Fix the head and avoid fixation on important blood vessels, frontal sinuses and muscles, thereby reducing the stability of the head, using the elbow joint as a fulcrum, while supporting the weapon frame, pulling the hook frame to repair and stabilize the brain tissue, thereby achieving stable. Accurate: The location of the brainstem tumor is deep, the surgery is delicate, and the surgical procedure is slightly biased, which may cause the loss of surrounding brain tissue, blood vessels around the lesion, and brain nerves. The operation of the operator must be stable and accurate to reach the lesion. The instruments used must be subtle and subtle, such as bipolar condensers, aspirators, micro-scissors, etc., must be long and thin to facilitate operation. Light: Nervous tissue is very soft and fragile. If it persists, even the traction and burning of nerves around the brainstem should be reduced in removal to protect nerve function, avoid damage to important nuclear masses and conduction beams, and 12 important blood supplies to the brain nerves or brainstem blood vessels. When transferring the instrument, you should accurately transfer the instrument to the main knife, understand how to operate next to save the operation time and reduce intraoperative bleeding; when understanding the wrapping of bipolar burn tissue, carefully wash with wet gauze to ensure effective electricity Coagulation; In order to reduce the stimulation of the brainstem and avoid serious postoperative complications, bipolar power should be reduced as much as possible to ensure effective electrocoagulation. If bleeding occurs, hemostatic materials can be used to compress the hemostasis. After the equipment nurse corrects and presses the small cotton pads, after hemostasis, he injects normal saline, slowly peels off the hemostatic material, and stops bleeding. Microsurgery has a small space, a deep location, and difficult operations. During surgery, especially in the posterior cranial fossa, care should be taken to trim items (such as cotton wool) to facilitate operation. Care should be taken to adjust the suction of the aspirator to an appropriate intensity. If the suction is too great, brain tissue or bleeding can be easily removed. Root surgery should preserve respiratory function as much as possible. If the tumor boundary is unclear, EEG monitoring can be used. Sometimes the intracranial pressure is not high after the dura mater is opened, but the intracranial pressure gradually increases during the operation. It should be noted whether there is bleeding, infarction and venous return vascular injury. If the ascent is ruled out one by one, attention should be paid to whether the airway is unobstructed. If breathing is not good, $PaCO_2$ will be too high, stimulating the recipient and causing blood pressure to rise.

### *3.2. Experimental Methods*

According to the results of MRI examination, a proper surgical approach should be selected before surgery. Different surgical approaches should be adopted for brain stem tumors in different parts. It should be emphasized that tumors should be cut into the brain stem at the closest part of the brain stem. In addition, different resection methods should be adopted for different tumors to reduce damage to the brain stem. . The principle of tumor resection is to remove as many tumors as possible while preserving nerve function, in order to reduce the pressure on the brain stem, open the cerebrospinal fluid circulation, and relieve intracranial hypertension. Radiation therapy is performed on patients with residual tumors to extend survival. In this group, 11 tumors were located in the neck, dorsal medulla, and inferior pontine, all of which were treated with the suboccipital median approach; 2 cases of tumors in the posterior midbrain and superior and lateral pontine were treated by the suboccipital approach; the other 2 were located lateral The tumors in the front of the pontine were treated with the suboccipital sigmoid sinus approach. Imaging examination: All patients were diagnosed by CT and MRI. In brainstem tumors, 1 was located in the midbrain, 5 in the pons, 6 in the medulla, 1 in the midbrain and pons, 1 in the pons and medulla, and 1 in the neck. Because the age span of brain stem tumor cases is relatively long, in the case of a large number of losses, the treatment result of judging time is based on the discharge.The results are divided into: Good: the patient's consciousness is completely clear, there is no neurological dysfunction, and there is no obvious Mental retardation and mental symptoms; mild disability: have mild neurological dysfunction or mild mental decline or / and psychiatric symptoms, but they can live and take care of themselves completely; severe disability: severe neurological or conscious disorder that requires care of others Or further clinical treatment; death. In the statistical analysis of discharge results, good and mild disability was the group with good prognosis, and severe disability and death were the group with poor prognosis. Finally, the good prognosis and the poor prognosis were calculated.

## 4. Discussion

### *4.1. Analysis Under the Microscope*

(1) Brain stem tumor site

**Table 1.** Brain stem tumor site

| Site of occurrence | Hemangioblastoma | Astrocytoma | Ependymoma | Glioblastoma | Metastatic tumor |
|---|---|---|---|---|---|
| midbrain | | 1 | | | |
| Midbrain -pons | | 1 | | | |
| Pons | | 1 | | 1 | 2 |
| Pons-Oblongata | | 1 | | | |
| Oblongata | 1 | 2 | 2 | | |
| Neck extension | 2 | | 1 | | |
| Total | 3 | 6 | 3 | 1 | 2 |

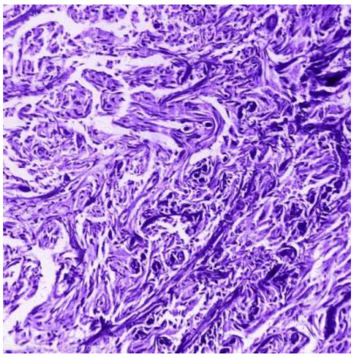

**Figure 1.** Astrocytoma

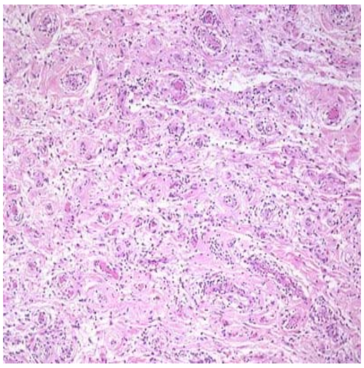

**Figure 1.** Hemangioblastoma

According to the statistical analysis of the data, as shown in Figure 1, Figure 2, and Table 1, there are 3 cases of hemangioblastoma, including 1 in the medullary medulla and 2 in the medullary neck. There are a total of 6 astrocytomas, of which 1 is located in the midbrain, 1 is located in the midbrain-pontine, 1 is located in the pontine, 1 is located in the pontine-medulla, and 2 is located in the medulla. . There were 3 cases of ependymal tumors, 2 cases were located in the pontine-medulla, and 1 case was located in the neck. There were 1 case of glioblastoma and 1 case of pontine. There were 2 cases of metastases and 2 cases of pontine.Epimental tumors are common in young and middle-aged patients. Sometimes there is a signal of vascular flow holes in its winding direction. Cystic changes are often seen in cervical elongational ependymoma. Cystic cavities are located inside or at both ends of the tumor. Hemangioblastoma is most common in young adults and occurs in the dorsal side of the brainstem, mostly in the medulla oblongata. CT manifestations are single cystic or solid round lesions, mostly equal density, low density or mixed density lesions. Cystic lesions can be seen with equal density. After enhancement, the parenchyma or parietal nodules were significantly enhanced. Contrast-enhanced solid lesions were significantly enhanced, and blood flow signals of curved vessels were visible; another feature was the formation of huge cysts around the tumor. If whole-brain angiography is feasible, the whole tumor can be seen to be heavily stained. Even tumors as large as a few millimeters can clearly show their staining and the expansion of the tumor's blood supply arteries. If the main lesion can be identified, combined with the above findings, the diagnosis will be clear.

(2) Pathological results

**Table 2.** Pathological results

| Pathological type | Pathological number | Percentage（%） |
|---|---|---|
| Astrocytoma | 6 | 42.8 |
| Hemangioblastoma | 3 | 17.7 |
| Ependymoma | 3 | 17.7 |
| Glioblastoma | 1 | 5.3 |
| Metastatic tumor | 2 | 15.5 |
| Total | 15 | 100 |

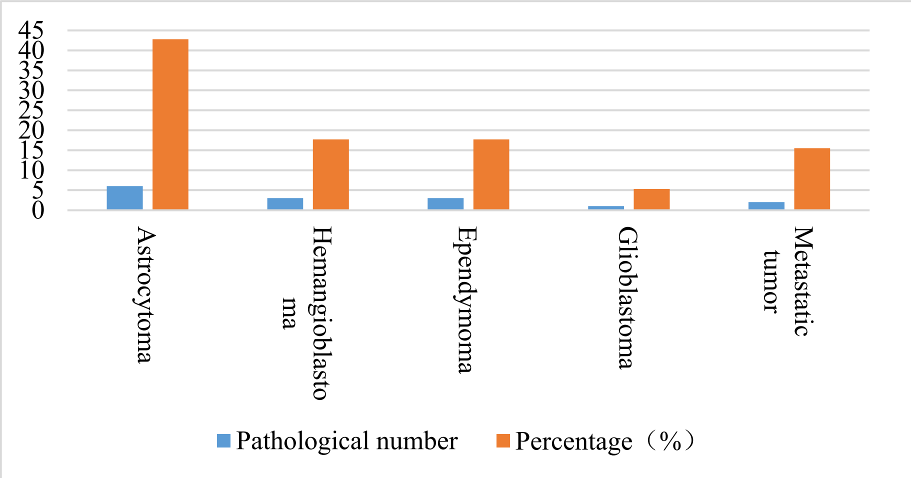


**Figure 2.** Pathological results

According to the statistical analysis of the data, as shown in Figure 3 and Table 2, in the pathological results of 15 brain stem tumors, 6 cases of astrocytoma accounted for 42.8%, 3 cases of hemangioblastoma accounted for 17.7%, 3 cases accounted for 17.7% of membrane tumors, 1 case of glioblastomas accounted for 5.3%, and 2 cases of metastatic tumors accounted for 15.5%.Intracranial metastases mostly occur in the cerebral hemisphere and cerebellum, and are mostly multiple and different in size. About 13% of intracranial metastases metastasize to the brainstem at the same time. Epimental tumors are rare in adults and clinical reports are rare. Most ependymal tumors develop into the surrounding cavities. For example, aqueducts can not only be completely located in the aqueduct, but can also develop into the third ventricle or the fourth ventricle head; The development to the fourth ventricle can also progress to the cerebellar pontine angle through the lateral foramen; the medullary ependymal tumor grows to the fourth ventricle and cistern, or along the central canal, the medullary and cervical spinal cords are pushed into the ring, and a few tumors are completely located in the medullary Inside.

*4.2. Analysis of Brain Stem Tumor Treatment Results*

(1) Tumor resection

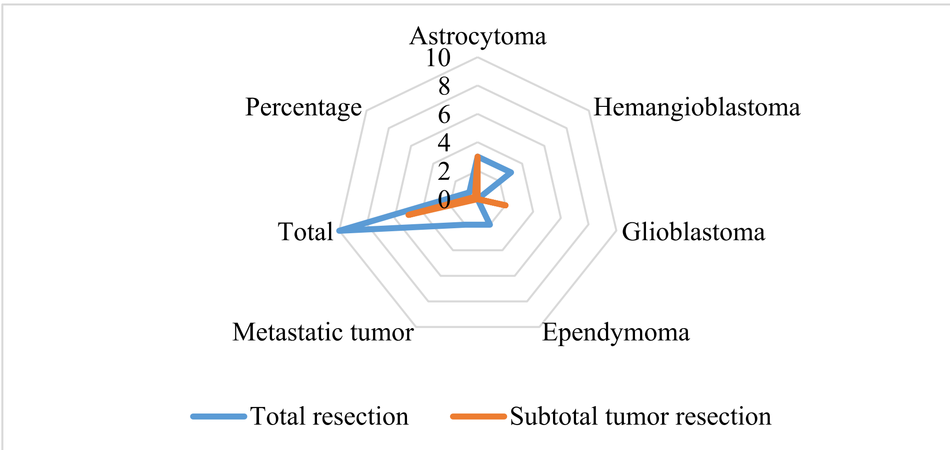


**Figure 3.** Degree of tumor resection

According to the statistical analysis of the data, as shown in Figure 4, the degree of tumor resection is as follows: Of the 15 brainstem tumors, 10 were completely resected under the microscope, accounting for 75%, of which 3 were astrocytomas, 2 were ependymal tumors, and blood vessels There were 3 cases of blastoma and 2 cases of metastases. Subtotal tumor resection accounted for 25% in 5 cases, including 3 cases of astrocytoma and 2 cases of glioblastoma. Glioma is occasionally in the brainstem and spinal cord. Tumors can be cystic or parenchymal. Cystic is common, accounting for 73% of the total. There are characteristic large cysts and small nodules. Thin-walled tissue types are rare, accounting for about 27%. Mastering the degree of resection of gliomas not only does not damage the brainstem tissue, but it is the skill and difficulty of surgery to remove as many tumors as possible, and it is also the key to successful surgery. Eminent ependymoma of the brainstem can be removed in one piece or in one piece. Most of them can be cut off in one piece. Pay attention to protect brainstem function. If the tumor is tightly adhered to the brainstem, it is not easy to completely remove it. A thin layer of tumor can be left on the brainstem. At least unblock the cerebrospinal fluid circulation.

(2) Complications and discharge results

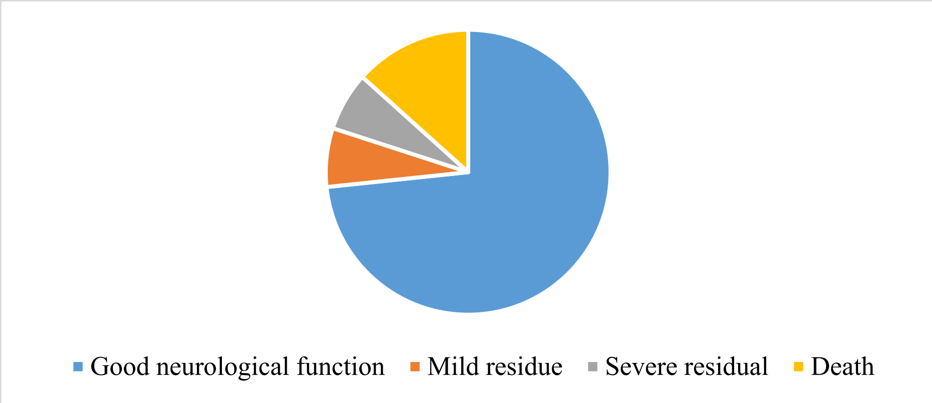


**Figure 4.** Complications and discharge results

According to the statistical analysis of the data, as shown in Figure 5, 15 cases of postoperative complications of brainstem tumors and discharge from hospital, 11 cases with good neurological function, 1 case with mild residue, 1 case with severe residue, and 2 deaths; 1 case of pontine astrocytoma, Postoperative respiratory dysfunction occurred. After 12 days of ventilator-assisted treatment, the family gave up treatment and died of respiratory failure after being discharged from hospital; another case was renal cancer metastasis to the right axillary bridge, unstable walking before surgery, and obvious cerebellar symptoms. Seven days after nephrectomy, the right pontine tumor was removed. Fifteen days after nephrectomy, the patient died of renal failure. In brainstem tumor surgery, bleeding is very easy to enter the cerebrospinal fluid circulation, leading to the presence of blood in the cerebrospinal fluid subarachnoid space, which can easily lead to adhesion and surrounding tissues, leading to blocked cerebrospinal fluid circulation, local hematoma, swelling of brain tissue, tumor residues, etc Wait. Therefore, the incidence of hydrocephalus is high, and there are still many patients with hydrocephalus after tumor resection. The main causes of hyperthermia are brainstem injury, muscle tension in the extremities, and excessive fever. Due to the influence of the hypothalamic regulatory center, the temperature of patients with saddle tumors can reach 40 ° C; most patients can return to normal after medication, physical cooling or artificial hibernation. Especially when surgically removing a brain stem tumor, it should be gentle and reduce traction. Hyperthermia after surgery should be treated in time to prevent further hypoxic edema in the brain tissue and affect the prognosis of patients. Epilepsy is a serious postoperative complication. The most common manifestations are major seizures, often manifested as disturbances of consciousness and generalized convulsions, which are the main reasons for the poor prognosis of patients with epilepsy. Abnormal high-frequency discharge of neurons during epileptic seizures directly leads to brain cell damage, apnea or suffocation leads to hypoxic edema of brain tissue, which can lead to memory loss, mental retardation and mental abnormalities, which can worsen or even die in severe cases. Lung infections have become a common complication. It can prolong the hospital stay of patients, use antibiotics for a long time, and long-term lung infections cannot be controlled, which may easily lead to respiratory failure and heart failure. Most antibiotics are difficult to cross the blood-brain barrier, clinical treatment drugs are scarce, and the efficacy is poor. Intracranial infection has become a common serious complication after neurosurgery. Patients in a coma are mainly suffering from severe brainstem injury, severe compression and deformation, damage to the internal brainstem's reticular structure, damage to the reticular ascending activation system, and failure of the nerve center responsible for the human awakening consciousness to transmit information to Cerebral cortex, operated immediately after coma, dehydration, nutritional nerves, arousal and other medications, ventilator to maintain breathing, nasal feeding diet, nutritional medication application. After 2 weeks, the patient's consciousness gradually improved, and after 1 month, the patient gradually wake.

## 5. Conclusions

(1) Based on the correct selection of surgical indications, using rich microanatomical knowledge and superb surgical techniques, microsurgery was performed on brainstem and surrounding brainstem tumors, and satisfactory results were obtained.

(2) Choosing different surgical approaches according to different tumors can reduce nerve function damage. For tumor bases located in the brainstem, for exogenous tumors whose main body protrudes out of the brain, the

tumor should be completely removed during surgery; for endogenous or localized localized brain stem tumors, it should also be removed as far as possible.

(3) It should not be forcibly deleted to avoid causing severe neurological dysfunction or even death, brain radiation, radiation therapy can prolong the survival of patients with residual tumors after surgery, and proper perioperative management is also an important factor for successful surgery.

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