

Research Article

Comfortable Nursing in the Intraoperative MRI Evaluation Combined with Microsurgery in the Treatment of Functional Area Glioma

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This study was aimed to investigate the application value of magnetic resonance imaging (MRI) scanning examination in the preoperative treatment of functional glioma and to analyze the application effect of nursing intervention in the operating room in the treatment of fiber surgery. In this study, 80 patients with functional glioma were included as research objects and randomly rolled into the control group (routine nursing) and the experimental group (comfort nursing intervention in the operating room), with 40 cases in each group. All patients underwent craniocerebral MRI plain scan plus enhanced scan before surgery. The levels of the heart rate, systolic blood pressure, diastolic blood pressure, interleukin-6 (IL-6), cortisol, and anxiety before and after the intervention in the two groups were compared when patients entered the operating room (T1), when anesthesia took effect (T2), at the end of surgery (T3), when patients regained consciousness after surgery (T4), and 1 day after surgery (T5). MRI showed that the main glioma sites were located in the basal ganglia region (26.25%), followed by the central region (20.00%) and the Broca region (17.5%). The levels of IL-6 at T2, T3, and T4 in the control group were 186.45 ± 64.55 ng/L, 287.68 ± 34.59 ng/L, and 488.69 ± 81.14 ng/L, respectively, which were inferior to those at T2 (167.44 ± 15.59 ng/L), T3 (186.25 ± 52.64 ng/L), and T4 (356.57 ± 48.22 ng/L) in the test group. The SAS score of the test group after intervention (45.38 ± 2.02) was lower than that of the control group (51.03 ± 3.65) ($P < 0.05$). The levels of cortisol in the test group (T2 (8.89 ± 1.23 ng/L), T3 (9.23 ± 1.25 ng/L), and T4 (11.78 ± 1.27 ng/L)) were lower than those in the control group (T2 (11.58 ± 2.48 ng/L), T3 (12.06 ± 2.82 ng/L), and T4 (13.04 ± 11.78)). In short, preoperative MRI scanning was beneficial to detect the location of glioma in functional area. Comfort nursing in the operating room can effectively relieve the anxiety and depression of glioma patients and improve the adverse psychological conditions of the patients.

1. Introduction

Different regions of the cerebral cortex are functionally specific and have different functions, such as sensation and movement [1]. Gliomas show invasive growth and are defined as functional gliomas when they involve cortical or subcortical structures related to sensory, motor, language, vision, and other higher cognitive functions. It mainly includes sensory motor-related functional brain regions, language-related functional brain regions, and higher

cognitive function-related brain regions [2]. As a brain tumor disease, glioma is the most common primary malignant tumor in the brain, accounting for about 40%–50% of brain tumors, with an annual incidence of 3–8/100,000 [3, 4]. It includes many pathological types, and different pathological types have different grades. The prognosis of glioma varies with different pathological types and grades [5]. Glioblastoma (GBM) accounts for about 50% of gliomas and has a very poor prognosis. After standardized treatment, the median survival time of GBM is about

14.6 months, and the 5-year survival rate is only 9.8%, which can be regarded as the “mother of cancer” [6, 7]. Because of this we often think of glioblastoma as a somewhat incurable disease. However, the prognosis of other types of gliomas is significantly better than that of GBM, and some patients can even survive for more than 10 years. If glioma patients want to achieve a better survival time, standardized treatment is the key. At present, the standardized treatment of glioma includes the following methods. Surgery: surgery is often the first step in the treatment of glioma [8]. It can not only obtain pathological diagnosis but also remove most of the tumor cells, relieve the patient’s symptoms, and provide an opportunity for the next treatment. For some low-grade gliomas (generally referring to WHO grade I and II), such as pilocytic astrocytoma, complete surgical resection can make patients get a radical cure [9]. At present, glioma surgery has entered the era of minimally invasive surgery. Neuro-navigation technology, subcortical electrical stimulation technology, intraoperative nuclear magnetic resonance imaging, fluorescence imaging, intraoperative B-ultrasound, and other techniques can help surgeons to distinguish the boundary more clearly between tumor and the brain tissue. In order to protect the important neurovascular structures around the tumor, glioma can be maximally resected under the premise of safety [10]. Intraoperative MRI was the best. In addition to surgery, radiotherapy, chemotherapy, and targeted therapy can also be used to improve the quality of life of the patients and prolong their survival [11].

In recent years, with the continuous promotion of nursing work in clinical depth, the corresponding preoperative, intraoperative, and postoperative nursing is also in clinical application. This comprehensive nursing greatly increases patients’ nursing satisfaction, improves hospital service and treatment, and helps patients recover better and faster [12]. Comfort nursing is a comprehensive discipline, which enables people to achieve the most pleasant state in psychology, physiology, society, and spirituality through the study of nursing activities and comfort or shorten and reduce the degree of unhappiness [13]. At present, most patients with glioma are treated by surgery in clinical practice. However, surgery is a relatively large stressor, which will bring certain harm to the physical and mental health of patients with glioma. Some patients with glioma surgery often suffer from anxiety, anxiety, fear, and other adverse psychological conditions, which affect the smooth progress of clinical surgery [14, 15]. Therefore, this work selected the glioma patients in functional areas as the research objects by integrating the advantages of comfortable nursing and the psychology of the glioma patients undergoing surgery. Preoperative magnetic resonance imaging (MRI) was used to evaluate the glioma condition of the patients, and microsurgical resection was performed. Based on different nursing strategies, the anxiety of the patients under different nursing measures was observed after operation, so as to determine the intervention effect of comfortable nursing in the operating room to provide a certain reference for clinical better treatment and service of the glioma patients in functional areas.

2. Materials and Methods

2.1. Research Objects. In this research, 80 patients with glioma in functional areas admitted to hospital from January 2018 to January 2022 were selected as the research subjects. All patients were randomly rolled into the control group (routine nursing) and the experimental group (comfort nursing intervention in the operating room), with 40 cases in each group. In the experimental group, there were 31 males and 9 females. The age distribution range was 32–73 years, and the mean age was 48.25 ± 8.27 years. The course of disease was 12.54 ± 3.68 months, and the tumor size was 4.62 ± 1.44 cm. In the control group, there were 29 males and 11 females. The age distribution range was 30–75 years, and the mean age was 48.75 ± 7.56 years. The course of disease was 12.36 ± 3.43 months, and the tumor size was 4.48 ± 1.56 cm. There were no significant differences in gender, age, disease course, and other basic information between the two groups ($P > 0.05$), which were comparable. The study was approved by the Ethics Committee of Xuanwu Hospital Capital Medical University. The patients and their family members were aware of the content and methods of the study and agreed to sign the corresponding informed consent forms.

Inclusion criteria were as follows: (1) patients with pathological diagnosis of low-grade glioma [16]; (2) patients aged ≥ 18 years; and (3) patients with perfect clinical data.

Exclusion criteria were as follows: (1) patients with other tumors; (2) patients with liver and kidney dysfunction; (3) patients with multifocal epilepsy; (4) patients who were unwilling to cooperate with the whole follow-up process; and (5) patients with mental illness and cognitive impairment.

2.2. Research Methods. A total of 80 patients with glioma in the functional area were selected as the research object, and the patients were divided into a test group and a control group, with 40 patients in each group. The patients in the test group were given preoperative, intraoperative, and postoperative fine care, namely, operating room comfort care, while the patients in the control group were given routine care. The glioma was evaluated preoperatively using MRI and subsequently resected using microsurgery. Heart rate, systolic blood pressure (SBP), diastolic blood pressure (DBP), interleukin-6 (IL-6), and cortisol levels were recorded at the time of entering the operating room (T1), the time of anesthesia onset (T2), the end of surgery (T3), the time of recovery of consciousness after surgery (T4), and one day after surgery (T5), as well as the anxiety of the patients before and after intervention. After comparison, the intervention effect of comfortable nursing in the operating room was obtained.

2.3. MRI Preoperative Evaluation Combined with Microsurgery. Before surgery, according to the examination data of diffusion tensor imaging, diffusion-weighted imaging, oxygen-dependent functional magnetic resonance imaging, hydrogen proton magnetic covibration wave

spectrum, etc., the doctors in the nuclear magnetic laboratory and the surgeons jointly assessed the high and low grade of glioma, tumor boundary, and the morphological changes of cerebral cortical fiber bundles and the relationship between them and adjacent tumors, so as to determine the degree of resection. Additionally, they also determined the scalp incision site to select the surgical incision and the surgical approach. During the operation, the functional areas were guided by referring to the results of DTI to determine the structural and spatial relationship between the tumor, fiber tracts, and important functional areas. Under the guidance of ultrasound, functional areas were avoided, and the nearest cerebral sulci and cerebral gyrus approach to the tumor with no significant large blood vessels was selected to gradually approach the resected lesions. Under ultrasonic guidance, endoscopic resection was achieved as far as possible. During the operation, repeated ultrasonic exploration was performed to evaluate the extent of resection and the degree of residual to maximize the protection of the functional cortex, and the maximum extent of resection area tumor was performed under the microscope. Then, the degree and location of residual tumor were recorded. After resection, the probe was used to probe the residual cavity and the peritumoral surface of the operative area step by step, and the preoperative ultrasonic images were compared to determine whether there was residual or not. Then, the corresponding images were retained. All patients underwent the brain MRI plain scan plus enhanced scan before surgery, and the MRI scan showed that glioma was located in the functional area.

2.4. Comfort Nursing in the Operating Room. Operating room comfort nursing included preoperative, intraoperative, and postoperative nursing contents (Table 1).

2.5. Observation Indicators. Systolic blood pressure (SBP), diastolic blood pressure (DBP), heart rate (HR), and enzyme-linked immunosorbent assay (ELISA) was adopted to measure IL-6 levels, cortisol levels were detected by radioimmunoassay, and self-rating anxiety scale (SAS) scores were measured at the time of entry into the operating room (T1), the time of onset of anesthesia (T2), the end of surgery (T3), the time of recovery of consciousness after surgery (T4), and one day after surgery (T5).

2.6. Method of Statistics. In this study, SPSS 23.0 software package was employed for statistical data analysis. The Shapiro–Wilk test was adopted to test whether the data were normally distributed. The measurement data conforming to the normal distribution were compared among multiple groups by single factor and multiple data means, and the independent sample *t* test was utilized between the two groups. Measurement data that did not conform to normal distribution were tested by the rank sum test. Counting data were tested using the χ^2 test. According to statistical results, $P < 0.05$ was considered statistically significant.

3. Results

3.1. MRI Examination of the Glioma Growth Site. All patients included in this study were examined for glioma growth sites in their functional regions using both plain and enhanced MRI scans of the brain, and the results are shown in Figure 1. It was visualized that the growth sites of gliomas were basically located in the basal ganglia, Broca region, simultaneous iliac-temporal lobe involvement, central region, paracentral lobular, occipital lobe, and thalamus. Of which, the proportion of basal ganglia was as high as 26.25%.

3.2. Comparison of Blood Pressure Changes at Different Time Points. The diastolic blood pressure of the control group at T2 was 77.53 ± 14.23 mmHg, which was higher than that at T1 (71.32 ± 16.53 mmHg), and the difference was statistically significant ($P < 0.05$). There was no significant difference in diastolic blood pressure between the two groups at any observation time point ($P > 0.05$). The details are shown in Figure 2. In the control group, the systolic blood pressure at T2 was 128.73 ± 16.21 mmHg, which was higher than that at T1 (109.68 ± 18.83 mmHg), and the difference was statistically significant ($P < 0.05$). At T2, the systolic blood pressure of the test group was higher than that of the control group (120.56 ± 18.12 mmHg), and the difference was statistically significant ($P < 0.05$). There was no significant difference in systolic blood pressure between the two groups at other time points ($P > 0.05$). The details are shown in Figure 3.

3.3. Comparison of Heart Rate Changes at Different Time Points. There was no significant difference in the heart rate between the test group and the control group at each time point ($P > 0.05$). The details are shown in Figure 4.

3.4. Comparison of IL-6 Changes at Different Time Points. The levels of IL-6 at T2, T3, and T4 in the control group were 186.45 ± 64.55 ng/L, 287.68 ± 34.59 ng/L, and 488.69 ± 81.14 ng/L, respectively, which were increased compared with 154.42 ± 48.63 ng/L at T1. The difference was statistically significant ($P < 0.05$). In addition, the IL-6 levels at T2 (167.44 ± 15.59 ng/L), T3 (186.25 ± 52.64 ng/L), and T4 (356.57 ± 48.22 ng/L) in the test group were lower than those in the control group at the corresponding time points, and the differences were statistically significant ($P < 0.05$). The details are shown in Figure 5.

3.5. Comparison of Cortisol Levels at Different Time Points. The cortisol levels of the control group at T2, T3, and T4 were 11.58 ± 2.48 ng/L, 12.06 ± 2.82 ng/L, and 13.04 ± 11.78 ng/L, respectively, which were increased compared with 7.22 ± 2.53 ng/L at T1, and the differences were statistically significant ($P < 0.05$). In addition, the levels of IL-6 at T2 (8.89 ± 1.23 ng/L), T3 (9.23 ± 1.25 ng/L), and T4 (11.78 ± 1.27 ng/L) in the test group were lower than those in the control group at the corresponding time points, and the differences were statistically significant ($P < 0.05$). The details are shown in Figure 6.

TABLE 1: Specific content of comfort care in the operating room.

Types	Nursing contents
Preoperative nursing	<p>Before the operation, medical staff communicated with the patients about their physical and psychological conditions. Medical staff should pay attention to the tone and language organization of communication during communication and intuitively explain the relevant contents after operation to the patients in a simple way, such as the necessity of operation, the general process of operation, and precautions before operation, to relieve patients' preoperative tension, eliminate patients' anxiety and other adverse emotions, and increase patients' confidence in surgical treatment</p>
Intraoperative nursing	<p>Every operating room nurse should be energetic and focused in the work and conscientiously implement the operating procedures to ensure the safety of the patients. Itinerant nurses must know their surgical patients well and be prepared to take care of them, to fully understand the psychological changes of the patients and make necessary conversation patients as the center to eliminate their tension.</p> <p>During the operation, lidocaine gel was used for painless catheterization, and urine tubes were inserted after anesthesia as far as possible. When placing the patient's position, nurses should pay attention to observe and ask whether the patient was comfortable and make appropriate adjustments, scientific application of pressure ulcer protection pad, and effectively protect every patient</p>
Postoperative nursing	<p>After the operation, the medical staff continuously monitored the patients' ECG, paid close attention to the changes of the patients' vital signs and the movements of their limbs, wiped the residual disinfectant and blood on the patients' body surfaces, helped the patients to put on their clothes and bedding, added a bed bar and fastened their seat belts, and assisted the surgeons and anesthesiologists in transferring the patients to the ward</p>

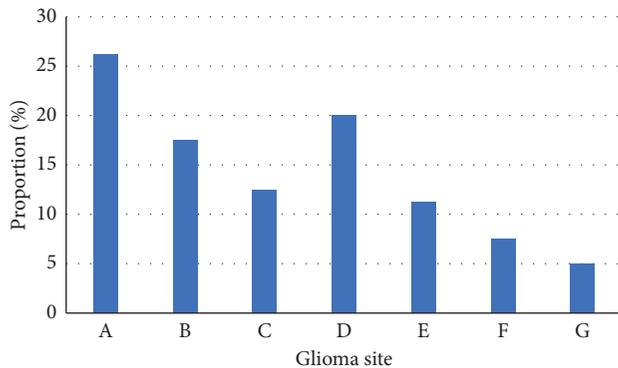


FIGURE 1: Functional area glioma growth site. A, B, C, D, E, F, and G represented the basal ganglia region, Broca region, simultaneous iliac-temporal lobe involvement, central region, paracentral lobular, occipital lobe, and thalamus, respectively.

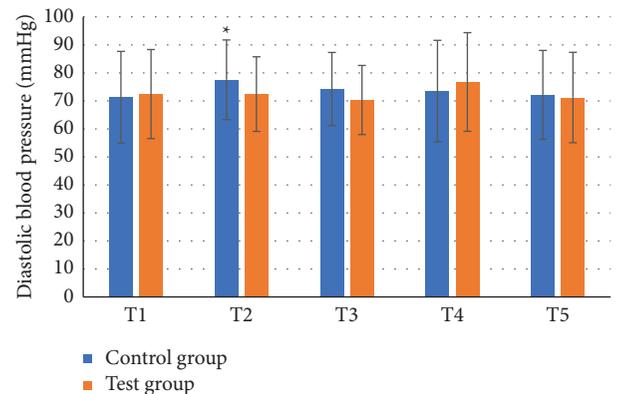


FIGURE 2: Comparison of diastolic blood pressure between the two groups at different time points. *Compared with the observation time point T1 in the same group, $P < 0.05$.

3.6. *Comparison of Anxiety Scores before and after Intervention.* There was no significant difference in SAS scores between the two groups before the nursing intervention ($P > 0.05$). The SAS score of the control group after intervention (51.03 ± 3.65) was lower than that before intervention (54.65 ± 5.34), and the difference was statistically significant ($P < 0.05$). The SAS score of the test group after intervention was 45.38 ± 2.02 , which was lower than that before intervention (54.66 ± 5.35), and the difference was statistically significant ($P < 0.05$). The SAS score of the test group after intervention was lower than the control group, and the difference was statistically significant ($P < 0.05$). The details are shown in Figure 7.

4. Discussion

Microsurgery is an important method for the treatment of glioma. However, as a stressor, surgery will further harm patients' physical and psychological health on the basis of disease damage, causing them to have negative temperament such as anxiety and fear [17, 18]. Therefore, the development of standardized and comfortable nursing for glioma patients in microsurgery can correspondingly reduce the perioperative stress reaction of the patients and contribute to the successful completion of surgery. Comfort nursing intervention is a nursing model developed based on holistic nursing that takes patients as the center [19]. This nursing

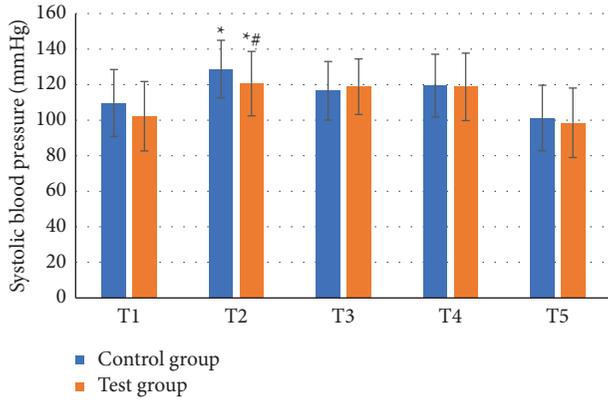


FIGURE 3: Comparison of systolic blood pressure between the two groups at different time points. *Compared with the observation time point T1 in the same group, $P < 0.05$; #compared with the control group at the same observation time point, $P < 0.05$.

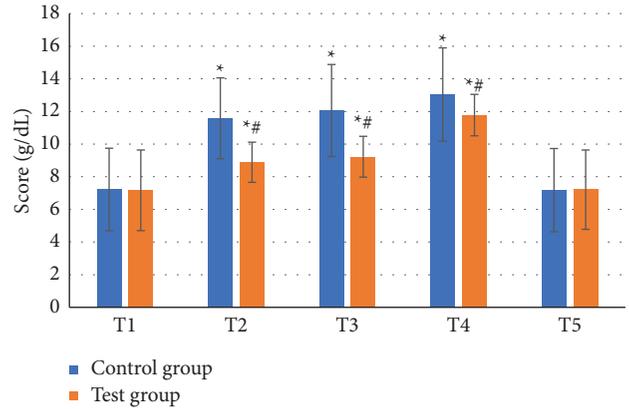


FIGURE 6: Comparison of cortisol levels between the two groups at different time points. *Compared with the observation time point T1 in the same group, $P < 0.05$; #compared with the control group at the same observation time point, $P < 0.05$.

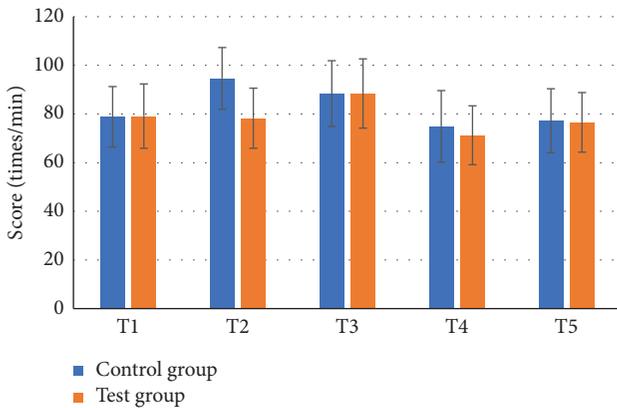


FIGURE 4: Heart rate changes in the two groups at different time points.

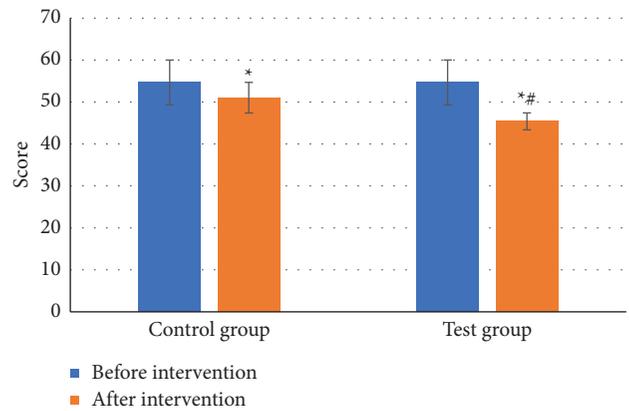


FIGURE 7: Comparison of SAS scores before and after nursing intervention between the two groups. *Compared with before the nursing intervention, $P < 0.05$; #compared with the control group, $P < 0.05$.

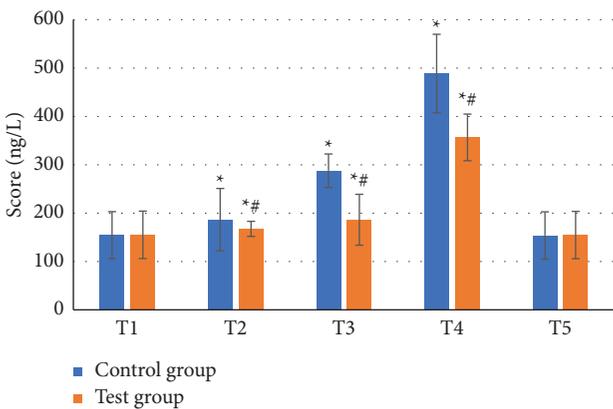


FIGURE 5: Comparison of IL-6 changes between the two groups at different time points. *Compared with the observation time point T1 in the same group, $P < 0.05$; #compared with the control group at the same observation time point, $P < 0.05$.

model not only gives the patients full respect, understanding, and care but also implements warm and thoughtful humanistic nursing services for patients [20]. Therefore, comfort nursing intervention for patients with glioma

surgery can meet their psychological and physiological needs as far as possible. In addition, it can obtain the full understanding and cooperation of glioma patients, thus helping to establish a good nurse-patient relationship [21]. This work showed that compared with the glioma patients in the control group, the systolic blood pressure, IL-6 level, and cortisol level of glioma patients in the experimental group were lower at T2, and the differences between groups were significant ($P < 0.05$). Compared with the glioma patients in the control group, the levels of IL-6 and cortisol at T3 and T4 in the glioma patients in the experimental group were lower, and the differences between groups were significant ($P < 0.05$). Heart rate and blood pressure are important related indicators reflecting the patient's cardiovascular system [22], while IL-6 and cortisol can reflect the severity and condition of the patient's stress response [23]. The results showed that the stress response of the experimental group was less than that of the control group. It shows that the patient's sense of security is improved and pain, fear, anxiety, and other symptoms are alleviated, in psychological and physiological satisfaction and security. In addition, in

this work, the SAS score of the glioma patients in the experimental group after nursing intervention was significantly lower than that of the glioma patients in the control group, and the difference between the groups was significant ($P < 0.05$). It shows that comfort nursing for patients with glioma can obviously relieve their anxiety and improve their bad psychology, which is worthy of popularization in clinical practice. In the study of Lank et al. [24], the experimental group adopted preoperative comfort nursing and intraoperative and postoperative comfort intervention and the results showed that the scores of anxiety and depression in the observation group were lower than those in the control group after intervention, showing $P < 0.05$. The results are similar. In addition, in the study of Meneguini et al. [25], serum cortisol of the observation group was lower than that of the control group after operation, and the difference was statistically significant; and it suggested that microsurgery can enhance the stress response of the body, and comfort nursing can reduce the stress response stimulation and maintain a good physical and mental state. This result is also consistent with the results of this work.

5. Conclusion

This study was aimed to investigate the application value of MRI scanning examination in the preoperative treatment of functional glioma and to analyze the application effect of nursing intervention in the operating room in the treatment of fiber surgery. The results showed that the preoperative MRI scan was beneficial to detect the location of glioma in the functional area. Moreover, comfort nursing in the operating room can effectively relieve the anxiety and depression of glioma patients and improve the adverse psychological conditions of the patients. However, due to the limitation of disease types, the sample size included in this study is small and the sample sources are concentrated, which may have certain influence on the final research results and lack of persuasion. Therefore, it is necessary to improve and optimize this aspect in the subsequent research.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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