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Experience with Six-handed Nursing Operation Under General Anesthesia for Oral Treatment in an Adult Patient

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Abstract

This study provides a detailed examination of the clinical nursing strategies employed in the care of an adult patient recovering from cranial trauma, who presented with significant anxiety and speech disorders. The patient, who sustained head injuries in an accident, underwent multiple craniotomies and was unable to undergo routine outpatient dental procedures. In response, comprehensive dental treatment was administered under general anesthesia to address these challenges. We utilized a six-hand technique in oral surgery, which involved coordinated efforts among team members: one focused on operational tasks and another on monitoring surgical progress. This method has shown that full-mouth dental treatment under anesthesia can efficiently resolve a plethora of dental health issues in a single session, greatly improving the patient's quality of life. Additionally, the six-hand technique has been proven to significantly enhance the efficacy of dental treatments, reducing the overall time required for surgeries under general anesthesia and minimizing patient discomfort. This approach not only streamlines the treatment process but also ensures high-quality care tailored to the specific needs of patients with complex medical histories.

Keywords

General Anesthesia; Nursing; Oral

Although dental general anesthesia (DGA) is a commonly used strategy to treat very young children or those with significant dental fear and cognitive or physical disabilities [1], its application in adult patients in China is rarely reported. The following case is of a patient with language disorders and anxiety who had extensive dental problems, we report this to highlight the importance of such DGA in such cases.

1. Medical Records

The 59-year-old female patient came to our hospital due to multiple episodes of decay and pain in the teeth. On examination, the patient was advised to have dental filling, root canal treatment, and tooth extraction. Her family history reveals that she underwent multiple craniotomies following a traumatic brain injury, including a frontal ventriculoperitoneal shunt performed four years ago. Due to the patient's impaired consciousness and inability to cooperate with clinical oral procedures, the family requested treatment under general anesthesia. Following an evaluation by our hospital's oral surgery anesthesia department, hospitalization for treatment was advised. The outpatient department admitted the patient with the following diagnosis: "(1) Residual roots in teeth 14, 22, 24, 27, 33, 34, 36, 42, 43, 46; (2) Tooth structure defects in 23, 26; (3) Poor restorations in 34, 35, 36." The patient maintained a good diet and spirits since the onset of the condition. Bowel and bladder functions were normal, and there was no significant weight change. Specialist examination: Facial symmetry was generally normal, mouth opening was adequate, with

normal type and range of motion, and absence of clicking in either joint. Residual roots in teeth 14, 22, 23, 24, 27, 33, 42, 43, and 47 were flush with the gum line, with no pain on percussion (−) and no mobility (−). Teeth 11, 12, 13, 15, 16, 17, 21, 25, 26, 32, 31, and 48 exhibited various degrees of cavity formation with a hard texture and dark color, gums were neither red nor swollen, and no fistulae were present. Crowns on 34, 35, and 36 had gaps at the margins, and overhangs could be probed at the gingival margin, were painful on percussion (+), and showed II° mobility, but there was no pain or mobility in the remaining teeth. The patient was uncooperative, which precluded some dental examinations, including occlusal relationships and overbite assessments. Tongue movement was free and without numbness. Salivary gland ducts appeared normal, with no redness, swelling, or pus discharge, and saliva secretion was clear and normal. No enlarged lymph nodes were palpable in the neck. Auxiliary examination: Chest radiographs (anteroposterior and lateral views, Nanning City Eighth People's Hospital, March 12, 2024) revealed no significant abnormalities. After completing all relevant examinations post-admission and ruling out surgical contraindications, the patient underwent tooth extraction, root canal treatment, restoration removal, and filling repair under general anesthesia on March 19, 2024. The procedures were completed without complications, and the patient was returned to the ward with stable vital signs.

2. Nursing

2.1 Preoperative Nursing

2.1.1 Complete all preoperative examinations

This includes a complete blood count, four coagulation tests, chest radiographs (anterior and lateral views), and cone-beam computed tomography (CBCT) of the maxillofacial region.

2.1.2 Preoperative visit

Ensure gastrointestinal preparation, mandating no liquid intake for 6 hours and no food intake for 8 hours before surgery. Evaluate for systemic diseases and surgical contraindications and provide psychological support to both the patient and family to help reduce anxiety.

2.1.3 Preparation of treatment materials

The patient is scheduled for comprehensive dental disease treatment, which will include procedures such as dental fillings, pulp amputation, root canal treatment, and tooth extraction. Preoperative preparations must encompass all materials required for the anticipated treatments.

In addition to standard material preparations, additional provisions should include equipment for preoperative, intraoperative, and postoperative photography, such as cheek retractors, reflective boards, and cameras, a spare high-speed turbine handpiece to reduce the frequency of changing burrs, and additional saliva ejectors to address potential contamination risks should an ejector be dropped.

2.2 Intraoperative Nursing

2.2.1 Patient positioning

The patient should be in a supine position to prevent compression of the tracheal tube and cables. Adjust the dental chair angle as needed based on the treatment site.

2.2.2 Protection of the angles of the mouth and oral mucosa

Apply sufficient petroleum jelly around the corners of the mouth before treatment to prevent damage from prolonged tension during surgery. Place a gauze pad in front of the throat inside the mouth to shield the surrounding mucosa from potential damage due to falling debris or instruments.

2.2.3 Six-handed technique at chairside

One team member is tasked with suctioning debris and water emitted from the turbine handpiece, retracting the corners of the mouth, ensuring a clear surgical field, and managing the curing light and cleaning burs or carving knives, another team member is primarily responsible for handling instruments, changing burs, replenishing cotton rolls, gauze, and irrigating solutions.

2.3 Postoperative Nursing and Follow-up

2.3.1 After surgery

Thoroughly verify that no cotton balls, cotton rolls, gauze, or instruments remain in the patient's mouth. Apply ice

packs to mitigate pain and administer recombinant bovine basic fibroblast growth factor gel to facilitate wound healing.

2.3.2 One-week postoperative follow-up

Conduct a follow-up via phone, the patient's family reported satisfactory wound healing and a significant enhancement in daily eating and living activities.

3. Discussion

3.1 Routine Clinical Dental Treatments

Routine clinical dental treatments at the chairside typically require the patient's active cooperation to keep their mouth open for extended periods and maintain a specific posture, often necessitating multiple follow-up visits. However, the patient discussed here is in the post-traumatic recovery phase of a cranial injury, exhibiting significant symptoms of anxiety and speech disorders. Cranial injuries, resulting from external forces impacting the head, cause organic damage to the brain tissue [2]. A strong impact on the cranial region can lead to complications such as paralysis, speech disorders, and even loss of autonomous control over certain body organs [3].

To address the patient's condition and ensure the delivery of efficient, high-quality oral treatment, our department opted for DGA (Dental General Anesthesia) for comprehensive dental disease treatment. The successful completion of this surgery not only resolved the patient's longstanding oral diseases but also significantly reduced the number of required visits and improved the patient's quality of life.

DGA is commonly used in pediatric patients and is less often applied to adult patients, due to the generally higher cooperation levels observed in adults. However, DGA should be considered when a patient exhibits dental fear, psychological anxiety, or other physical conditions that impede cooperation with the conventional outpatient treatment model.

3.2 Nursing Experience

3.2.1 Preparation of nursing materials

Given the patient's non-cooperation during examinations and inability to communicate verbally, medical staff face challenges in clearly assessing the condition inside the patient's mouth. This situation necessitates that nurses prepare the necessary materials for treatment based on the patient's maxillofacial CBCT and the doctor's orders, requiring both predictive capabilities and extensive clinical experience from the nurses.

3.2.2 Six-Handed nursing operation

The four-handed technique offers significant benefits in reducing patients' recovery time post-treatment, enhancing the efficiency of oral outpatient treatments, and substantially increasing patient satisfaction [4]. Utilizing the four-handed operation in oral outpatient treatments effectively lessens the workload of physicians, elevates the quality of clinical treatments, shortens physicians' bedside treatment duration, and reduces the risk of patient cross-infection [5].

Expanding upon the four-handed approach, we have adopted a six-handed operation. This enhanced nursing cooperation requires nurses to be proficient in various procedural steps, continuously monitor the progress of the surgery, and make timely adjustments to the instruments based on intraoperative conditions. Between the six-house operations, the nurses with specializations for sucking saliva respect the maintenance of the physician's surgical region, the physician's comfort during the surgery, and satisfaction with the base for high-quality treatment. And this is the focus when a nurse has the responsibility to pass the instruments to help the surgeon with instrument and burr hand-offs, exchanging needed instruments expeditiously and accurately.

The six-handed technique manages to make the procedure fast and the surgery short, thus ensuring a clear field for surgery and a prompt, sharp transfer of the instruments. This results in less anesthesia, thus decreasing tendencies for postoperative complications.

3.2.3 Psychological nursing

Patients recovering from cranial trauma often exhibit high rates of anxiety and depression [3]. It is hence very important for such patients to be monitored closely in terms of their physical and psychological recovery [6].

There was an eventful, palpable presence of severe anxiety and great demand for medical attention before the surgery. This shows that the unsatisfactory emotional conditions, such as pessimism, of this patient are a result not only of the cranial injury but also of the undealt distress from the oral diseases. It is thus a time for medical personnel

to be patient and attentive throughout the consultation process, actively reducing the distress of the patient. Moreover, through the psychological support of the family, the patient himself or herself can better cope with anxiety and tension; the cooperation of the family further supports the smooth course of both surgery and postoperative recovery.

4. Conclusion

In conclusion, DGA technology is therefore fundamental and of service to treatment in this class of adult patients who cannot use conventional methods of outpatient treatment for various reasons. Six-handed nursing cooperation greatly enhances efficiency and quality in oral diagnostics and treatment.

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