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Application Effects of Light Lumbar Anesthesia and Nerve Block Anesthesia in Elderly Hip Joint Surgery

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Abstract: *Objective:* To analyze the application effects of light lumbar anesthesia and nerve block anesthesia in elderly hip joint surgery. *Methods:* A total of 40 patients indicated for hip joint surgery from February 2021 to February 2022 were randomly divided into the control group and the observation group, each with 20 patients. The control group received nerve block anesthesia and the observation group was given light lumbar anesthesia. *Results:* Based on the results, the anesthetic effect in the observation group was better than that in the control group ($P < 0.05$), the difference was statistically significant. *Conclusion:* Compared with nerve block anesthesia, light lumbar anesthesia can achieve better analgesic effects and stable blood circulation in elderly patients undergoing hip joint surgery.

Keywords: Light lumbar anesthesia; Nerve block anesthesia; Elderly hip joint surgery

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1. Introduction

Femoral neck and intertrochanteric fractures are common in elderly patients. The tolerance of the elderly to anesthesia surgery is much lower than that of the younger population due to the decline in body function and the presence of cardiovascular, respiratory, and central nervous system diseases [1]. Therefore, for elderly patients, as long as it is not absolutely contraindicated, anesthesia methods that have the least impact on the functions of the respiratory, circulatory, and other systems will generally be chosen. A nerve block is a minimally invasive surgical procedure with less impact on the respiratory and circulatory systems. It is suitable for elderly and critical patients, but incomplete block may still occur due to differences in surgical procedures, surgical methods, and neuroanatomy [2]. Light lumbar anesthesia is simple, fast, effective, and has less impact on the patient's circulatory and respiratory functions [3]. This paper compares the application effects of lumbar anesthesia and nerve block anesthesia in elderly patients indicated for hip surgery.

2. General information and methods

2.1. General information

From February 2021 to February 2022, 40 patients indicated for hip joint surgery were randomly divided into

the control group and the observation group, with 20 cases in each group.

2.2. Methods

Patients in the observation group were treated with light lumbar anesthesia. On the left or right decubitus position of the affected hip joint, the subarachnoid was punctured by using a 22G puncture needle (Camel Medical Instrument Group Co., Ltd.), and the main L3–4 space was used as the puncture point. Subsequently, 12 mg of 0.5% light ropivacaine (AstraZeneca, Netherlands) was slowly injected, its total capacity was 2.5 mL, and the specific proportion of preparation method was: 1.5 mL 1% ropivacaine + 1.5 mL for sterilization and injection (Qilu Pharmaceutical, China).

In the control group, the patients were anesthetized with lumbar plexus block and sciatic nerve block. Taking the lateral position of the patient's hip joint upward, the Winnie method was used to locate the lumbar plexus puncture point and routine disinfection was applied. A 22G needle (Stimuplex, Braun, Germany) was used to perform lumbar plexus puncture under the guidance of the puncture needle and ultrasound with the nerve stimulator. After reaching the target puncture point and drawing the plunger back to confirm that there was no blood, 30 mL of 0.4% ropivacaine was injected; followed by flexion of the patient's hip at 45° and flexion of the knee at 70°. The sacrum parasacral approach was used to puncture the sciatic nerve under the guidance of ultrasound and 20 mL of 0.4% ropivacaine was injected into the target puncture point.

2.3. Observation indicators

The onset time of anesthesia, duration of sensory block, and duration of motor nerve block were compared between the observation group and the control group.

2.4. Statistical methods

The data were processed and analyzed by using SPSS21.0 software. The measurement data were represented by mean ± standard deviation (SD) and *t*-test was performed; the counting data were represented by % and χ^2. $P < 0.05$ indicated there was a statistically significant difference.

3. Results

Table 1 shows the comparison of anesthetic effects between the control group and the observation group. The anesthesia effect in the observation group was significantly better than that in the control group ($P < 0.05$).

Table 1. Comparison of anesthetic effects between the groups (mean ± SD)

Group	Number of cases	Onset time of anesthesia (min)	Duration of sensory block (min)	Duration of motor nerve block (min)
Observation group	20	2.9 ± 0.6	211.2 ± 32.5	72.4 ± 16.4
Control group	20	17.5 ± 2.1	450.65 ± 86.6	303.4 ± 74.5
t	-	29.8957	11.5771	13.5424
P	-	0.0000	0.0000	0.0000

4. Discussion

Elderly patients often have many chronic diseases, such as hypertension, coronary heart disease, diabetes, and so on, in addition to the deterioration of body function. Hip joint surgery is one of the most common operations

for elderly patients. The safety and efficacy of hip joint anesthesia have been the focus of discussion. With the improvement of the quality of life and long-term survival rate of elderly patients, the safe and effective implementation of anesthesia in elderly patients is required. Studies have shown that for elderly patients, the use of nerve block anesthesia or lumbar anesthesia can shorten the recovery time during surgery and improve postoperative recovery. However, the need for nerve block anesthesia or lumbar anesthesia in performing surgery for hip diseases has been controversial.

4.1. Epidemiology of hip diseases in elderly patients

With the aggravation of the aging society, the incidence of hip joint diseases is increasing in the elderly. According to the American Hip Association, about 50% of people over 80 have hip diseases. Among them, the rate of hip diseases in the elderly over 60 was 51%.

4.2. Characteristics of hip surgery in the elderly

With the increase in the elderly population, people's demands for quality of life and physical health are increasingly higher. Perioperative complications are important factors affecting the prognosis of elderly patients. Due to aging of the body, the elderly are often presented with a variety of chronic diseases, such as hypertension, coronary heart disease, diabetes, etc. These patients are prone to hypotension, hypoglycemia, and so on, thus affecting the smooth operation of anesthesia and surgery.

4.3. Application of nerve block anesthesia and lumbar anesthesia in elderly hip joint surgery

At present, general anesthesia, lumbar anesthesia, and nerve block anesthesia are commonly used in clinics. General anesthesia is suitable for patients with small operation ranges and mild conditions, while lumbar anesthesia is suitable for patients with large operation ranges and severe conditions. Both general anesthesia and lumbar anesthesia pose certain risks for the elderly. Along with the decline of the body function of elderly patients, many of them have common diseases, such as hypertension, diabetes mellitus, and so on. In addition, elderly patients have a lack of pain threshold due to impaired neurological function and poor perception of pain. General anesthesia and lumbar anesthesia may increase intraoperative risk in the elderly.

4.4. Comparison of advantages and disadvantages between nerve block anesthesia and lumbar anesthesia

In clinical work, nerve block anesthesia and lumbar anesthesia are often used as two different anesthetic methods. Nerve block anesthesia refers to the use of local anesthetics on the corresponding parts of the nerve block, so that in the course of surgery, patients have no pain and sensory abnormalities, can remain awake, and have a lowered risk of accidents. Its advantages are lowering the patient's stress response caused by surgery; reducing the postoperative pain and lower limb muscle tension; decreasing the secretion of antidiuretic hormone; reducing postoperative complications; and shortening the recovery time. However, clinical work also found that nerve block anesthesia can lead to certain complications, such as hypotension, bradycardia, hypoxemia, and so on. Therefore, choosing the appropriate anesthesia should be based on the actual situation in clinical work.

Lumbar anesthesia, lumbar plexus nerve block, and sciatic nerve block are the main anesthetic methods in orthopedic surgery, with each having its specific characteristics. Light lumbar anesthetic can block sensory, motor, and sympathetic nerves in a short time and reduce the stress response of patients. Based on the literature and our practice, we suggest that anesthesiologists should control the concentration of local anesthetics between 0.3% and 0.5%, and dosage between 10–12 mg. Ropivacaine has lower fat solubility, less motor block, and less myocardial toxicity, and improves the safety of the perioperative period, making it suitable for elderly patients.

Therefore, on the basis of previous research, this study intended to further explore the influence of different anesthetic methods and postures on blood circulation [4].

5. Conclusion

To sum up, light lumbar anesthesia can exert better anesthetic and analgesic effects on the limb of the operation side, and has good perioperative hemodynamic stability, especially with cardiovascular and cerebrovascular diseases in the elderly, hence having high clinical value. At present, the clinical application of light lumbar anesthesia and nerve block anesthesia needs to be further studied to determine the need for nerve block anesthesia or lumbar anesthesia in elderly hip surgery [5]. Currently, there is little research in this area, and there is still a lot of research space in the future [6]. Although some scholars have proposed a variety of nerve block anesthesia or lumbar anesthesia for surgery, but there is a lack of large sample, multicenter, randomized controlled trials to verify these views, necessitating further research. However, no matter what anesthesia method is used, it is essential to ensure the safety of elderly patients so that the operation can be completed successfully [7].

Disclosure statement

The author declares no conflict of interest.

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