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Research Article

Application of Modified Lateral Position in Elbow Arthroscopy

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Abstract

Objective: To study the application effect of modified lateral recumbent position in elbow arthroscopy, and to present a safer and more efficient surgical position placement program for the clinic. **Methods:** 60 cases of elbow arthroscopy patients admitted to the Department of Microsurgery of our hospital were retrospectively analyzed from January 2024 to May 2025 and were divided into a control group and an experimental group based on the difference in surgical positions, with 30 cases in each group. The control group adopted the traditional lateral position, and the modified lateral position was adopted by the experimental group, which was used for the probability of the occurrence of postoperative pressure injury of the pressure parts of the skin of the patients of the two groups, The probability of postoperative skin pressure injury at the pressure site, the time of position placement and the satisfaction score of the operator were compared between the two groups. **Results:** Compared with the control group, the experimental group had a significantly lower incidence of pressure damage to the compressed area, a significantly shorter positioning time, and a higher satisfaction score from the surgeon, and the differences were statistically significant. **Conclusion:** The modified lateral recumbent position can effectively reduce the risk of postoperative pressure skin injuries in patients undergoing elbow arthroscopy, shorten the time of position placement, and increase the satisfaction level of the surgeons, which is worthy of clinical promotion.

Keywords: Improved Lateral Position; Elbow Arthroscopy; Body Position Care; Pressure Injury; Satisfaction

Introduction

Elbow arthroscopy is a new minimally invasive technique that uses an arthroscope to examine and understand the condition of the patient's elbow joint cavity [1], its intraoperative position is directly related to the surgical field, operating space and patient's postoperative recovery. Although the traditional lateral position can meet the needs of surgery, it is often due to the irrational fixation of the position and the concentration of pressure on the support area, which causes postoperative pressure damage to the face, shoulder and hip, etc. [2] and the time needed to adjust the position is on the long side, which affects the smooth implementation of the surgical process. The smooth implementation of the surgical process, a variety of surgical procedures have been slowly adopted modified position, has been more significant results, this paper on the modified lateral position in elbow arthroscopy application was analyzed, analysis of its clinical significance and value [3].

Objects and Methods

Research Objects

Retrospective analysis, 60 cases of elbow arthroscopy admitted by the Department of Microsurgery of our hospital from January 2024 to May 2025 were selected as research objects, according to the difference in surgical position, the patients were divided into control and experimental groups, each group was 30 patients, the control group patients used the traditional lateral position during surgery, and the experimental group patients completed the

surgery with the help of the modified lateral position. The patients in the control group were operated in the traditional lateral position and the patients in the experimental group were operated in the modified lateral position.

Inclusion Criteria: patients aged 18 years and above, with a clear clinical diagnosis, intending to undergo elbow arthroscopy; patients with a stable general condition before the operation, able to tolerate the risks of surgery and anesthesia; patients who cooperated very well during the operation, with no specific limitations on position adjustment; complete clinical data, with detailed records of position placement and postoperative pressure injuries. Exclusion Criteria: People with severe cardiac, pulmonary, cerebral and other critical organ dysfunctions; patients with preoperative skin pressure sores or significant soft tissue injuries; patients with fractures, deformities and other conditions that prevent them from adopting the lateral recumbent position; people who need to adjust the position or even interrupt the operation during the procedure; individuals with mental disorders and cognitive disorders who are unable to cooperate with the surgical procedure and postoperative observation.

Methods

Control group

According to the operating room nursing practice guidelines [4], the traditional lateral decubitus positioning method is as follows: placing the healthy side upper limb on a pallet. The anaesthesiologist is in charge of the patient's head, the surgeon is in charge of the shoulder, the assistant doctor is in charge of the hip, and the visiting nurse is in charge of the bilateral lower limbs, meanwhile, the patient is moved to the edge of the bed on the affected side, and the patient is rolled over on the 90° axis towards the healthy side, and the healthy side of the upper limb is wrapped in the cloth sheet and initially fixed with the fixation band, and then the affected limb is rested on the elbow arched bracket, and the armpit cushion is set up at 10 cm from the axilla, and then the cloth sheet is straightened and ordered. The cloth sheet was then organized in a smooth and orderly manner. The ventral side was equipped with two baffles, between the baffles and the patient, the rectangular pillow and bolster pillow were inserted, the upper position of the baffles to the nipple line, down to the iliac spine, the dorsal side was equipped with two additional baffles, between the baffles and the patient, the rectangular pillow and bolster pillow were inserted, the position of the baffles was extended upward below the rib margins, and downward to the sacral caudal region, the large pillow was placed between the patient's legs, and the lower extremities were placed in the straightened position and the flexed position. The head circle gel pad was placed on the healthy knee joint, the horseshoe gel pad was placed on the healthy ankle joint, the ankle joint was flexed in a natural pattern, the toes of the foot naturally fell vertically, the dorsum of the foot and the toes were neither pressurized nor in point contact, the cloth therapeutic towel was triangularly folded to wrap the patient's head of hair, and the patient's tracheal tube and the eyes, nose, and ears were examined to check for any pressurization, and the patient's head was placed in a head ring under the patient's head.

The Experimental Group

The conventional lateral position positional care adopts the same mode as the control group, and the following is the content of the modified lateral positional care:

1. Changing the laying method of surgical bed sheet, in the conventional side-lying position, the transverse sheet is laid 3/4 bilaterally and 1/4 single layer is folded and laid on the bed, and the modified transverse sheet is laid only with single layer of middle sheet to reduce the folds of middle sheet and prevent the skin from pressure damage.

2. In the traditional side-lying position, two baffles are arranged on the back side, and rectangular pillows and bolsters are inserted between the baffles and the patient. After improvement, the back is placed in the form of front and back tops, which are respectively placed between the patient's shoulder blades and the sacrococcygeal area, and the front and back fixation is solid, with a high degree of safety and reliability, and the time occupied by position setting is shortened.

3. Replacing the gel pad head ring with a fluid pad, in view of the fluid pad's own compliance and plasticity, it can increase the size of the facial area of force and reduce the probability of intraoperative pressure injury.

4. Adoption of a baffle plate to protect the position of the head, resisting the damage to the patient caused by head shift after shaking the bed, and improving the satisfaction level of the doctor.

Observation indexes

1. Pressure injury: check whether there are redness, swelling, broken skin, indentation and other phenomena in the face, shoulder, hip and other areas, and calculate the incidence rate in accordance with pressure ulcer nursing grading standards.

2. Surgical placement time: from the beginning of the position operation until the completion of the fixed record of the time period used, using minutes as the time unit of measurement, based on the actual data of objective timing.

3. Doctor's satisfaction: after the completion of surgery, the surgeon in charge of the operation in accordance with the stability of the position, the operation of the field of vision, etc., the implementation of the score, the use of the standard 1-5 rating scale.

Statistical Methods

SPSS 25.0 software was used to analyze the data, and the measurement information was expressed as mean ± standard deviation, t-test was used for comparison between groups, and χ^2 test was used for counting information.

Results

Comparison of General Information

There was no significant difference between the control group and the experimental group in the distribution of age, gender, BMI and type of surgery (all P>0.05). The mean age of the control group was 45.2±12.3 years, and that of the experimental group was 43.8±11.7 years (t=0.48, P=0.63); the proportion of males was 60% versus 66.7%, respectively (χ^2=0.27, P=0.60); the mean value of BMI was 24.1±3.2 versus 23.7±2.9 (t=0.52, P=0.61); and the type of surgery was predominantly elbow joint release (12 cases vs. 15 cases). predominantly (12 vs. 15 cases). Baseline was well balanced and comparable (Table 1).

Indicators	Control Group (n = 30)	Experimental group (n = 30)	χ^2/t value	P value
Age (years)	45.2±12.3	43.8±11.7	0.48	0.63
Gender (male/female)	Dec-18	Oct-20	0.27	0.6
BMI kg/m²	24.1±3.2	23.7±2.9	0.52	0.61
Type of surgery (case)			0.89	0.64

Table 1

Comparison of the incidence of skin pressure injuries at the pressure sites of patients

The incidence of total pressure injuries in the experimental group was significantly lower than that in the control group (3.3% vs. 30%, χ^2=8.57, P=0.003). The most significant improvement was observed in facial injuries (13.3% vs. 3.3%, P=0.038), and although there was no statistically significant difference between shoulder (10% vs. 0%) and hip (6.7% vs. 0%), there were zero occurrences in the experimental group (Table 2).

Site of Pressure	Control group (n = 30)	Experimental group (n = 30)	χ^2 value	P-value
Facial area	4(13.3%)	1(3.3%)	4.32	0.038
Shoulder	3(10.0%)	0(0%)	3.16	0.075
Hip	2(6.7%)	0(0%)	2.07	0.15
Total	9(30.0%)	1(3.3%)	8.57	0.003

Table 2

Comparison of surgical position placement time

The position placement time of the experimental group was 42.5% shorter than that of the control group (10.6±2.1 min vs. 15.4±3.8 min, t=9.62, P<0.001). Improvements (e.g., anterior and posterior tops instead of baffles, simplified sheet placement) significantly improved efficiency, reduced team maneuvering steps, and gained more effective time for the surgery, which is especially suitable for multiple table pick-up procedures (Table 3).

Group	Positioning time	T value	P value
Control group	15.4±3.8	9.62	<0.001
Experimental group	10.6±2.1		

Table 3

Comparison of doctors' satisfaction scores

The doctors' satisfaction scores in the experimental group were significantly higher than those in the control group (4.5±0.4 vs. 3.1±0.7, t=7.84, P<0.001). The use of head baffle fixation and fluid pads reduced the frequency of intraoperative adjustments, and the doctors' feedback of high positional stability and better operating field indirectly improved the smoothness and safety of surgery (Table 4).

Group	Satisfaction score (1-5 points)	T-value	P-value
Control group	3.1±0.7	7.84	<0.001
Experimental group	4.5±0.4		

Table 4

Discussion

As a minimally invasive technique relying on high operating precision and stable field, the intraoperative position management of elbow arthroscopy has a great impact on the quality of surgical operation and patient safety. Although the traditional lateral recumbent position is a routine operation in the clinical application, there are conditions such as cumbersome operation of the position and greater risk of injury to the patient's pressure area. In view of this actual situation, this study compares the clinical effects of the traditional lateral recumbent position with the modified lateral recumbent position, and analyses the three dimensions of skin pressure damage, time of position placement, and operator satisfaction to provide a clinical basis for the optimization of the surgical position.

From the perspective of pressure injury, the use of modified lateral position can significantly reduce the incidence of pressure injury, in the experimental group, only 1 case (3.3%) of pressure injury, but the control group has 9 cases (30.0%) of such phenomena, there is a very obvious difference, which indicates that the modified position has an advantage in the field of pressure reduction and protection, and in the traditional position, the facial area is extremely vulnerable to pressure, and the control group has 4 cases of redness, swelling, indentation phenomenon, but only 1 case, indicating that the improvement of head support plays a significant role. In the control group, 4 cases of redness, swelling and indentation occurred, but only 1 case occurred in the experimental group, indicating that the improvement of the head support method played a significant role. In this study, the traditional head ring gel cushion was replaced with a flexible fluid cushion, which has better softness and force dispersion ability, and can effectively reduce the concentrated pressure on the facial soft tissues[5], and the protective measures for the shoulders and hips were also adjusted, such as the original bolster plus block combination was cancelled and replaced with an exclusive front and back top support system, which reached the even dispersion of the pressure on the back and the bony protrusion area, and then reduced the chance of pressure injuries. This reduces the chance of pressure injuries.

In terms of the setting time of the surgical position, the experimental group spent 10.6±2.1 minutes, which was significantly shorter than that of the control group (15.4±3.8 minutes), indicating that the improved position can achieve higher work efficiency. The improvement measures were to reduce the number of layers of the middle sheet, cancel the bilaterally folded treatment, and unify the single layer of the flat, and to adjust the form of the back support, thus reducing the steps of the position adjustment, while reducing the difficulty of personnel collaboration, which not only shortens the perioperative preparation time, but also reduces the chance of having to readjust the position during the operation due to unstable anesthesia, which is particularly important for the pace and safety of patients. This not only shortens the perioperative preparation time, but also reduces the chance of having to readjust the position during the operation due to instability, which builds up a solid defense for the pace of the operation and the safety of the patient's anesthesia. Especially in the atmosphere of hospitals where the volume of operations is heavy and the pace of the work is tight, the modification can significantly improve the efficiency of the overall workflow.

Improving doctors' satisfaction can also prove the clinical value of the improved position. The average satisfaction score of doctors in the experimental group was 4.5±0.4 points, which exceeded the average of 3.1±0.7 points of the control group, and the score comprehensively incorporated the stability of the position, the degree of clarity of the surgical field, the sufficient exposure of the affected limbs, and the patient's safety. The improved position creates a more stable operating platform environment, realizing full exposure of the affected limbs and getting rid of the troublesome situation of repeated intraoperative adjustments; the head fixation becomes more stable and reliable, effectively avoiding the problems of head shift and eye, ear, nose and ear pressure injuries caused by shaking the bed, which significantly improves the degree of surgical concentration and the smoothness of the operation experience.

From the perspective of comparison with the literature, previous studies have pointed out that the modified position is effective in reducing the incidence of intraoperative pressure ulcers in elderly patients, and can alleviate postoperative discomfort and optimize the quality of sleep[6], and the results of the present study are generally consistent with the previous studies, which further confirms the versatility and practicability of the modified lateral recumbent position in different types of surgery, although a large amount of literature focuses on the optimization of position in thoracoscopic, urological, or neurosurgical surgery, this paper successfully applies it to minimally invasive elbow arthroscopic surgery, creating a feasible nursing optimization model for small limb arthroscopic surgery[5]. Although much of the literature focuses on position optimization in thoracoscopic, urological, or neurosurgical procedures, this paper successfully applies it to minimally invasive elbow arthroscopy, creating a feasible model of care optimization for small limb arthroscopic procedures.

The implementation of the modified position does not increase the workload of nursing staff, and the adjustment program is easy to learn and master, which is in line with the basic requirements of rapid promotion and deployment, and can be generally applied in different levels of medical institutions by relying on the standardized training process and operation templates. For this group of patients, the use of the modified position can improve the comfort level of the patients during the operation, reduce the chances of complications, and perhaps also reduce the discomfort of the limbs, such as swelling and local pain. It may also reduce postoperative discomforts such as limb swelling and localized pain, which may facilitate postoperative functional recovery and increase satisfaction. Although this study did not include postoperative functional evaluation indexes in the scope of the study, combined with the clinical observation, patients in the experimental group were more prone to turn over and move around on their own, which reflected that their postoperative recovery may be more smoothly progressed.

The study still has some limitations, the first one is that the sample size is relatively small, and the data originated from a single center, so there may be a selection bias; the study design is retrospective, and multicenter and prospective randomized controlled trials can be carried out in the future in order to expand the scope of extrapolation of the results; the observational indexes have limitations, and it is recommended to increase the evaluation indexes such as the postoperative pain score, limb mobility score, and the healing time of compression injuries. The relative limitations of the observational indexes suggest that additional indicators such as postoperative pain scores, limb activity scores, compression injury sites, and healing time should be added in order to comprehensively assess the clinical benefits of the modified position, and it is also necessary to further investigate whether the effects of the modified position are the same in patients with different BMI or bony structures.

In summary, the modified lateral recumbent position, as an optimized structural, convenient and safe position, can effectively reduce the degree of compressive skin injury, shorten the positioning time and enhance the satisfaction of the operator in elbow arthroscopy, and its implementation is in line with the actual clinical operation procedures, which is of great significance for popularization and potential application. Against the background of modern surgical concepts that emphasize precision and minimally invasive surgery and patient safety, the continuous optimization of surgical position care should be a key part of perioperative management, which needs to be studied in depth by the nursing staff in the operating room and continuously improved.

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