SURGICAL POSITIONING: PREVALENCE OF RISK OF INJURIES IN SURGICAL PATIENTS

Posicionamento cirúrgico: prevalência de risco de lesões em pacientes cirúrgicos

Posicionamento quirúrgico: prevalencia de riesgo de lesiones en pacientes quirúrgicos

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ABSTRACT: Objective: To determine the prevalence of patients at risk of developing lesions due to surgical positioning. **Method**: A cross-sectional study was carried out in a private hospital in southern Brazil. Randomized sample with 378 adult patients submitted to elective surgeries between January and September 2017. The Risk Assessment Scale for the Development of Injuries due to Surgical Positioning (ELPO) was used after anesthetic induction and a descriptive analysis was performed. **Results**: The prevalence of patients at high risk of developing lesions was 19.05% (n=72). The lithotomic position was identified as the one with greatest risk (59.72%; n=43). The mean ELPO score in the sample was 16.317 (standard deviation=3.6176) and the median was 16, meaning low risk of developing lesions. **Conclusion**: ELPO allowed to determine the prevalence of risk for lesions in patients submitted to elective procedures, identifying that the risk is more related to surgical position than to the size of the surgery.

Keywords: Patient positioning. Risk assessment. Intraoperative period. Perioperative nursing. Wounds and injuries.

RESUMO: Objetivo: Determinar a prevalência de pacientes em risco de desenvolvimento de lesões decorrentes do posicionamento cirúrgico. **Método**: Estudo transversal, realizado em hospital privado localizado na região sul do Brasil. Amostra aleatória com 378 pacientes adultos submetidos a cirurgias eletivas entre janeiro e setembro de 2017. Foi aplicada a Escala de Avaliação de Risco para o Desenvolvimento de Lesões Decorrentes do Posicionamento Cirúrgico (ELPO) após indução anestésica e realizada análise descritiva. **Resultados**: A prevalência de pacientes com alto risco de desenvolvimento de lesões foi de 19,05% (n=72). O posicionamento identificado como de maior risco foi a litotomia (59,72%; n=43). O escore médio da ELPO na amostra estudada foi 16,317 (desvio padrão=3,6176) e a mediana foi de 16, o que significa baixo risco de desenvolvimento de lesões. **Conclusão**: A ELPO permitiu determinar a prevalência de risco para lesões em pacientes submetidos a procedimentos eletivos, identificando que o risco está mais relacionado com a posição cirúrgica do que com o porte da cirurgia.

Palavras-chave: Posicionamento do paciente. Medição de risco. Período intraoperatório. Enfermagem perioperatória. Ferimentos e lesões.

RESUMEN: Objetivo: Determinar la prevalencia de pacientes en riesgo de desarrollo de lesiones derivadas del posicionamento quirúrgico. **Método**: Estudio transversal, realizado em um hospital privado em el Sur de Brasil. Muestra aleatoria con 387 pacientes adultos sometidos a cirugías electivas entre enero y septiembre de 2017. Se aplicó la Escala de Evaluación de Riesgo para el Desarrollo de Lesiones Transcurrentes del Posicionamiento Quirúrgico (ELPO) después de la inducción anestésica y análisis descriptivo. **Resultados**: La prevalencia de pacientes con alto riesgo de desarrollo de lesiones fue del 19,05% (n=72). El posicionamiento identificado como de mayor riesgo fue la litotomía (59,72%, n=43). El score promedio de la ELPO en la muestra estudiada fue 16,317 (desviación estándar=3,6176) y la mediana fue de 16, lo que significa bajo riesgo de desarrollo de lesiones. **Conclusión**: La ELPO permitió determinar la prevalencia de riesgo para lesiones en pacientes sometidos a procedimientos electivos, identificando que el riesgo está más relacionado con la posición quirúrgica que con el porte de la cirugía.

Palabras clave: Posicionamiento del paciente. Medición de riesgo. Periodo intraoperatorio. Enfermería perioperatoria. Heridas y lesiones.

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INTRODUCTION

The ideal surgical positioning for the patient should be as anatomical and physiological as possible, maintaining body alignment with minimum tension and pressure on the tissue, preserving ventilatory and circulatory functions, and avoiding unnecessary exposure, in addition to allowing the surgeon good access to the surgical site, and access to infusion and monitoring lines to the anesthesiologist[1]. All staff (anesthesiologist, surgeon, and nurses) should be involved with this process right after anesthetic induction in order to provide safe and comfortable positioning of the patient.

Skin lesions (SL) due to surgical positioning are considered to be adverse events caused by the surgical procedure. The ideal is to identify and avoid preventable damage by creating metrics and standards. Therefore, the measurement of this event is essential for the improvement of surgical patient care[2].

A study validated a risk assessment scale for the development of lesions due to surgical positioning, which was applied to a sample of 115 patients submitted to surgical procedures, and found SL development in 25 of them (21.7%); 46 of them (40.0%) had pain related to postoperative surgical positioning[3]. Of lesioned patients, 3 had SL prior to the procedure, causing it to evolve; 2 had SL in the period immediately after the surgical procedure; and 20 patients identified SL within the subsequent 72 hours[3].

A discrepancy was observed in the results found in studies on lesions due to surgical positioning. Another retrospective study, which evaluated 38.000 procedures in medical records, found records of 40 lesions, with a prevalence of 0.1%[4]. A longitudinal study with 199 patients showed an incidence of 20.6% of lesions[5]. This issue is worrying, as these lesions may be transient or permanent, increasing the length of hospital stay and delaying the recovery of the patient[6].

Depending on the surgical position, anesthesia, and duration of surgery, the patient may be at increased risk for positioning lesions, added to age and comorbidities. Nurses at the surgical center (SC) should be alert to identify at-risk patients and avoid adverse events resulting from positioning[7,8].

The basic positions which originate surgical positioning are three: supine or dorsal decubitus; prone or ventral decubitus; and lateral. Each position may lead to others, including some changes, such as: elevation of the knees, adduction or abduction of lower or upper limbs, and Trendelenburg position, among others[9]. The prone position is the most challenging one for the surgical team, once the patient is usually placed in this position after being anesthetized, unable to signal any discomfort from the positioning or to rearrange oneself during surgery[1,10].

The final decision on the patient's positioning usually lies with the surgeon, however, the care nurse must participate in this process and act on the patient's best interest whenever any given factor is interfering with their safety[1].

Strategies should be adopted to reduce the risk of positional injury, such as the use of support surfaces, foam, gel and transoperative repositioning, whenever allowed by the procedure[8,11].

The Braden scale predicts the risk of SL, but is used for clinical patients and is not recommended during surgical procedures, since it does not evaluate specific factors such as surgical time, anesthesia and comorbidities[8].

In 2013, an instrument was created and validated to evaluate the risk of developing lesions and to provide subsidies for the improvement of intraoperative nursing care through the development of protocols aimed at patient positioning[3]. The Risk Assessment Scale for Injury Development Due to Patient Surgical Positioning (*Escala de Avaliação de Risco para Desenvolvimento de Lesão Decorrente do Posicionamento Cirúrgico do Paciente* – ELPO) has proven to be a valid instrument for risk assessment in patients, to predict outcomes such as SL and pain in the postoperative period due to surgical positioning. Due to it being a new instrument for assessing risk of positional injury, its scope need to be expanded, with other researches being carried out in different hospital contexts[3].

Thus, the authors of this article, who are nurses working in SC, considered important to know the profile of patients receiving care at a private institution, tracing the research problem, and to investigate the prevalence of patients at risk of developing lesions due to surgical positioning.

OBJECTIVE

To determine the prevalence of patients at risk of developing lesions due to surgical positioning.

METHOD

A cross-sectional study, conducted in a large general private hospital, located in Porto Alegre, Rio Grande do Sul, Brazil.

Its SC has 17 operating rooms, in which 22.129 surgeries were performed in 2016.

A random probability sample was chosen, consisting of 378 patients submitted to surgical procedures. To calculate the sample, the greatest risk of development of intraoperative lesions was considered, using the WINPEPI software for Windows, version 11.43, developed by Paul M. Gahlinger, with a 95% confidence interval, margin of error of 5% and proportion of 50%. Inclusion criteria were: age equal or superior to 18 years and having an elective surgery scheduled, regardless of the surgical specialty.

One of the researchers trained seven nurses from the SC to apply the ELPO scale to the patients seen in the three shifts (morning, afternoon, and night). Data collection period was from January to September 2017.

Data collection took place daily, with the drawing of the patients from the computerized surgical scale. Using the Microsoft® Excel software, a randomly-numbered column for each surgery was created in the scale, which was organized in ascending order, with the first seven patients selected from the list. In the admission room of the SC, the patients previously drawn were approached by the nurse or nurse technician, who explained the research objective and investigated their interest in participating in the study. In case of acceptance, the patient was provided an Informed Consent in two copies, keeping a copy to themselves. The patient was then taken to the operating room (OR), positioned and anesthetic induction was performed. Only after these steps were complete did the nurse evaluate the patient and fill out a manual spreadsheet with data regarding the ELPO scale; later, the data was typed into an Excel worksheet.

The ELPO scale suggests a cutoff point, whereby patients with a score equal to or less than 19 are considered to have a lower risk for the development of lesions due to surgical positioning; and patients with a score equal to or greater than 20 are considered at higher risk[3]. The analysis was performed through descriptive statistics, presented in proportion, median, mean, and standard deviation (SD).

The research was registered in *Plataforma Brasil* and approved by the Institution's Research Ethics Committee, CAAE No. 59023916.6.0000.5330.

RESULTS

Regarding the sample's surgical profile, 259 female patients (68.52%) were identified; 199 as ASA (American Society of Anesthesiology) II in relation to anesthetic risk (52.64%), and 159 were submitted to medium-sized procedures (42.06%) (Table 1).

The mean ELPO score in the investigated sample (n = 378) was 16.317 (SD = 3.6176), median of 16, with a minimum score of 7 and a maximum score of 26.

Table 2 shows that 209 patients (55.29%) remained in the supine or dorsal position during surgical procedure; and for 276 of them (73.01%), the surgery lasted for up to 2 hours. Cotton pads were used in 170 patients (44.97%). The anatomical position was adopted in 70 (18.51%) and the opening of the upper limbs, at a maximum of 90°, in 175 (46.30%). It was found that 234 patients (61.69%) had no comorbidities which could increase the risk of positional lesions.

By the application of the ELPO scale, 72 surgeries with higher risk for lesions resulting from the positioning were identified, being classified according to their surgical size: 22 small, 22 medium-sized and 28 large ones. Of those, regarding positioning: 43 patients (59.72%) were in the lithotomy position, 14 (19.44%) were in the supine position, 9 (12.50%) were prone, 4 (5.56%) were in lateral decubitus, and 2 (2.78%) in Trendelenburg.

Table 1. Distribution of surgical patients (n=378) according to gender, ASA classification, size of the surgery, and Risk Assessment Scale for the Development of Injuries due to Surgical Positioning, treated at the surgical center of a private hospital. Porto Alegre (RS), 2017.

Variables	Frequency n (%)
Gender	
Male	119 (31.48)
Female	259 (68.52)
ASA	
I	162 (42.86)
II	199 (52.64)
III	17 (4.50)
Size of the surgery	
Small	151 (39.95)
Medium	159 (42.06)
Large	68 (17.99)
ELPO classification	
Low risk	306 (80.95)
High risk	72 (19.05)

ELPO: Risk Assessment Scale for the Development of Injuries due to Surgical Positioning.

Table 2. Distribution of the variables assessed though the Risk Assessment Scale for the Development of Injuries due to Surgical Positioning in patients treated at the surgical center of a private hospital. Porto Alegre (RS), 2017.

ELPO variables	Frequency n (%)
Age of the patient (years)	
Between 18 and 39	115 (30.42)
Between 40 and 59	150 (39.68)
Between 60 and 69	75 (19.84)
Between 70 and 79	24 (6.35)
Over 80	14 (3.71)
Comorbidities	
No comorbidities	234 (61.90)
Vascular disease	88 (23.28)
Diabetes mellitus	08 (2.12)
Obesity or malnutrition	47 (12.44)
PU or previously diagnosed neuropathy	01 (0.26)
Duration of surgery (hours)	
Up to 1 hour	139 (36.77)
More than 1h and up to 2	137 (36.24)
More than 2h and up to 4	89 (23.55)
More than 4h and up to 6	12 (3.18)
Over 6h	01 (0.26)
Type of anesthesia	
Local	39 (10.32)
Sedation	71 (18.78)
Regional	42 (11.11)
General	217 (57.41)
General + regional	09 (2.38)
Support surface	
Viscoelastic surgical table mattress + viscoelastic cushions	120 (31.75)
Surgical table foam mattress + viscoelastic cushions	–
Surgical table foam mattress + foam cushions	88 (23.28)
Surgical table foam mattress + cushions made out of sterilization wraps	170 (44.97)
No use of support surfaces or rigid supports without padding or narrow leg support	–
Position of the limbs	
Anatomic position	70 (18.51)
Opening <90º of upper limbs	175 (46.30)
Knee raised <90º and opening of lower limbs <90º or neck without sternal alignment	115 (30.42)
Knee raised >90º or opening of lower limbs >90º	12 (3.17)
Knee raised >90º and opening of lower limbs >90º or opening of upper limbs >90º	06 (1.60)

ELPO: Risk Assessment Scale for Injury Development Due to Surgical Positioning of the Patient; PU: Pressure ulcer.

DISCUSSION

In the sample investigated, a mean ELPO score of 16 was obtained, which means low risk for the development of lesions due to surgical positioning[3]. In the SC studied, an average of 2.000 surgeries are performed monthly, with approximately 80% being small and medium-sized. Of the 72 surgeries identified as having a higher risk for lesions due to positioning, 22 were small, 22 were medium-sized and 28 were large, therefore, it was verified that the risk of injury was not directly related to size.

Positioning is one of the fundamental factors for performing a safe and effective procedure. When positioning the patient, care must be taken with the joints of their hips, knees, and upper and lower limbs, as nerve injuries can occur[6] if the opening or flexing of the extremities is wider than 90º. As for the positioning of limbs, in the evaluation criteria presented in the ELPO, it was identified that 95.23% of the sample was positioned within the accepted opening and flexion limits.

Table 2 shows that the most used surgical positions were supine or dorsal (55.29%) and lithotomic (22.75%). The supine position is more anatomical; it causes an increase in abdominal visceral pressure on the inferior vena cava, which reduces the return of venous blood into the heart[7,12]. Complications related to this position occur due to inadequate positioning and prolonged procedure time[13]. In the lithotomic position, the patient is positioned in supine position, with the abducted lower limbs resting on an elevated leg support, forming an angle of approximately 90º with the hip joint. This position poses a higher risk of complications due to pressure in the sacral and lumbar regions[9]; therefore, specific protection should be used, such as adhesive or viscoelastic support pad[14]. The pressure of the support in legs and feet may damage the fibular nerve, causing the feet to "fall". The greater the flexion of the lower limbs on the hip, the greater the intra-abdominal pressure, decreasing pulmonary expansion[12]. This position may cause complications for any patient, although elderly, malnourished, and obese[6,9] ones are more severely and frequently affected[13]. As for the positioning in the 72 surgeries identified with the highest risk for lesion development, it was evidenced that: 43 patients (59.72%) were in a lithotomic position; 14 (19.44%) in dorsal decubitus; 9 (12.5%) in prone; 4 (5.56%) in lateral decubitus, and 2 (2.78%) in Trendelenburg. This study observed that most patients in lithotomic position were classified with greater risk for injury.

A study carried out with the objective of evaluating the incidence of lesion due to surgical positioning and pointing out its risk factors identified lesions in 12.20% of the 172 patients evaluated. Of the patients with lesions, 90.50% were classified as ASA II and ASA III[15]. The data contained in Table 1 show 57.14% of the sample with an anesthetic risk classification similar to the cited study. Patients classified with ASA III or higher are at increased risk for the development of lesions[8]. In the present study, only 4.5% of the subjects were identified as ASA III.

Positioning lesions occur three times more often among patients undergoing surgeries longer than two hours[15]. With respect to surgical time, 102 procedures (26.99%) lasted longer than 2 hours and, for 276 patients (73.01%), the procedures lasted 2 hours or less, with a lower risk of injury.

Two studies on lesions and risk factors associated general anesthesia with the greater occurrence of lesions, once they reduce sensitivity. This is the technique of choice in large surgeries with a longer duration and an incidence of lesions of 85.70[15] and 75%[4] was found in patients submitted to this anesthetic method. General anesthesia was used in 217 patients (57.41%) in the present study.

Sheets and blankets decrease the effectiveness of support surfaces used in the positioning of surgical patients[8]. In the sample studied, cushions made out of sterilization wraps were used in 170 patients (44.97%), and in 120 (31.75%), a mattress or viscoelastic cushions. These devices offer more benefits to patients, especially elderly ones, and in surgeries lasting more than two hours[9]. The mattresses of all surgical tables in the institution where this study was performed are viscoelastic.

A study on SL risk factors evidenced a higher incidence in the age range between 38 and 58 years (40.60%)[16]. However, in another study, the same outcome occurred among patients aged 45 and 64 years (52.40%)[15]. Research has shown that age has an influence on the risk of developing lesions; however, it should not be an isolated evaluation criterion[16-18]. The majority of patients in the sample were in the range between 40 and 59 years (39.68%).

Vascular diseases predispose to the occurrence of SL; 34% of patients who developed lesions had systemic arterial hypertension[4], and this risk increases when associated with other comorbidities and advanced age[15]. In patients with a body mass index of less than 20 or greater than 30, overweight and underweight increase friction and shear[6,16,19]. In the sample studied, 88 patients (23.28%) had vascular disease and 47 (12.44%) had obesity or malnutrition. However, 234 (61.90%) of them had no comorbidity associated with increased risk of injury, thus, most of them had a lower risk.

Regarding the limitations of the study, it is noteworthy that it was performed in a single institution, and the outcome of the positioning injury was not measured. It is suggested, for future studies, that it be applied in other hospital settings, as well as to monitor and record the occurrence of lesions in patients assessed at high risk by the ELPO scale.

CONCLUSION

The use of the ELPO scale allowed determining a prevalence of 19.05% of patients submitted to elective procedures with higher risk of developing lesions due to surgical positioning, identifying that the risk is more related to the surgical position than to the size of the surgery. The mean ELPO score was 16, indicating that the study sample consisted of patients with lower risk.

This diagnosis is considered important, as it allows nurses to focus the planning of the assistance provided. The scale was proven effective in qualifying intraoperative patient care.

It is suggested that the ELPO scale be used as a lesion risk assessment protocol for all surgical patients, as well as that foam and cotton pads be replaced with viscoelastic cushions. Future research may assess the outcome of musculoskeletal pain and lesions resulting from surgical positioning in the immediate postoperative period, relating these events to risk assessment.

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