

ABRASIVE INJURY AFTER CARDIAC CATHETERISM: CASE REPORT

Lesão por abrasão após cateterismo cardíaco: relato de caso

Lesión por abrasión después del cateterismo cardíaco: relato de caso

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ABSTRACT: Objective: To report a case of skin abrasion related to dressing removal after cardiac catheterization via the femoral artery. **Method:** Report of a case registered in a university hospital in Northeastern Brazil, occurred in September 2017. **Results:** The patient was submitted to cardiac catheterization, which indicated myocardial revascularization surgery. In the preoperative period, the skin lesion was identified, extending transversely in the abdomen, infraumbilical region and the inner side of the right thigh, corresponding to the region where the post-catheterization compressive dressing was performed. **Conclusion:** The post-catheterization compressive dressing should be performed and nursing should pay special attention to its removal, due to the risk of abrasion, which can affect a large area, causing direct damage to the patient and increasing the risk of infection.

Keywords: Postoperative complications. Wounds and injuries. Cardiac catheterization. Thoracic surgery. Nursing care.

RESUMO: Objetivo: Relatar um caso de lesão de pele por abrasão relacionada à retirada de curativo pós-cateterismo cardíaco via artéria femoral. **Método:** Relato de um caso registrado em um hospital universitário do Nordeste do Brasil, ocorrido em setembro de 2017. **Resultados:** A paciente foi submetida a um cateterismo cardíaco, que indicou cirurgia de revascularização miocárdica. No período pré-operatório, identificou-se a lesão de pele, que se estendia transversalmente no abdome, na região infraumbilical e na face interna da coxa direita, correspondendo à região em que foi realizado o curativo compressivo pós-cateterismo. **Conclusão:** O curativo compressivo pós-cateterismo deve ser realizado e a enfermagem deve dar atenção especial à sua retirada, em virtude do risco de lesão por abrasão, que pode acometer uma grande área, ocasionando dano direto ao paciente e aumentando o risco de infecção. **Palavras-chave:** Complicações pós-operatórias. Ferimentos e lesões. Cateterismo cardíaco. Cirurgia torácica. Cuidados de enfermagem.

RESUMEN: Objetivo: Informar un caso de lesión de la piel relacionada con la extracción del apósito después del cateterismo cardíaco a través de la arteria femoral. **Método:** El informe de un caso registrado en un hospital universitario en el noreste de Brasil que ocurrió en septiembre de 2017. **Resultados:** El paciente fue sometido a cateterismo cardíaco, lo que indicó cirugía de revascularización miocárdica. En el período preoperatorio, se identificó la lesión de la piel, que se extiende transversalmente en el abdomen, la región infraumbilical y el lado interno del muslo derecho, correspondiente a la región donde se realizó el apósito compresivo post-cateterismo. **Conclusión:** El apósito compresivo post-cateterización debe realizarse y la enfermería debe prestar especial atención a su extracción, debido al riesgo de abrasión, que puede afectar a un área grande, causando daño directo al paciente y aumentando el riesgo de infección.

Palabras clave: Complicaciones postoperatorias. Heridas y lesiones. Cateterismo cardíaco. Cirugía torácica. Atención de enfermería.

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INTRODUCTION

In addition to risks inherent to an invasive procedure and the use of contrast, cardiac catheterization via femoral artery causes discomfort to the patient, who needs to stay motionless while the compression dressing is in place¹.

Nursing care provided to patients who undergo this procedure must be integral and attentive to complications². To prevent bleeding, bruising, and ecchymosis at the puncture site, a compression dressing of large extension, that can serve as a tourniquet on the thigh, is applied. After catheterization, patients — at most services in the country — remain motionless and restricted to bed, while this dressing is kept in place for up to six hours, even when there is evidence that this time can be safely reduced to up to three hours^{3,4}.

Complications arising out of this procedure are already well documented. However, we could not find any reference to abrasion injury during removal of compression dressing in the literature searched. Possibly because it rarely occurs, or for being an adverse event that is not specific to catheterization³⁻⁶, which justifies the present study.

OBJECTIVE

To report a case of skin abrasion injury related to removal of post-cardiac catheterization dressing via femoral artery.

METHOD

Report of a case registered in a university hospital in the Northeast of Brazil, which occurred in September 2017. Case of skin abrasion injury related to removal of post-catheterization dressing via femoral artery, with description of how the adverse event occurred, its relevance and implications in the perioperative period of cardiac surgery.

The patient was evaluated in two moments: first, on the day before surgery, 12 days after diagnostic catheterization, and in the intraoperative period, that is, when the heart surgery happened.

For data collection, medical records were referred to, in addition to preoperative and intraoperative assessments by the researchers. In the preoperative period, on the day before surgery, an enterostomal therapist visited the patient, described

the lesion state, and registered the risk of the patient if submitted to heart surgery.

This case report is part of a research project on surgical positioning and skin injuries in perioperative period, approved by the Committee for Ethics in Research of the institution where the study was conducted (CAAE: 66142117.0.0000.5208, Report: 2.045.355). Important to mention that the patient agreed with the execution of this study and publication of images. The authors undertook to use the information to conduct this study only and to keep the research subject's identity anonymous.

RESULTS

An elderly female patient, 67 years old, obese (body mass index – BMI=36.3 kg/m²), hypertensive, non-insulin-dependent diabetic, non-smoker, non-drinker, stated suffering from paroxysmal nocturnal dyspnea and edema in lower limbs for approximately three years, without investigating the cause.

She had acute chest pain and was sent to the reference cardiology emergency, after being treated in an emergency care unit. During pre-hospital care, she remained hemodynamically stable, but complained of tight retrosternal pain, which lasted more than 12 hours, accompanied by dyspnea, with partial oxygen saturation (Sat O₂>94%). Electrocardiograms showed a new right bundle branch block and changes indicative of acute myocardial infarction (AMI), with corresponding elevation in markers of myocardial necrosis. The staff implemented a compensation strategy and referred the patient to cardiac catheterization.

The procedure was performed without urgency, via femoral artery, with a 6-French introducer sheath, following the routine for coronary artery evaluation and ventriculography. There was no entry in medical record regarding removal of introducer or dressing made by the nurses after the procedure.

On the day following the catheterization, an echocardiogram confirmed the indication for myocardial revascularization (MR) surgery. The surgery was scheduled for ten days later, that is, 12 days after catheterization.

On the day before surgery, the patient received a routine preoperative visit, in which a nurse evaluates the patient, gives them instructions about the perioperative period, and answers their questions. Upon the visit, the surgery center (SC) nurse identified the injuries and required evaluation by an enterostomal therapist.

The lesion had characteristics of skin abrasion in the area of compression dressing, commonly applied after hemodynamic procedures. It stretched across the infraumbilical area (Figure 1) and reached the anterior and inner side of the right thigh (Figure 2), without signs of infection, with receding edges, and signs of reepithelization. The enterostomal therapist registered her findings in the medical records, communicated them to the nurse of that area, and contacted the physician responsible for the heart surgery. The latter confirmed being aware of the situation, but stated that the patient should still undergo surgery because of the risks of delaying this second procedure.

On the day of the surgery, the patient was taken to the SC after being prepared with preoperative bath, shaving – including lower limbs –, and peripheral venous access. After entering the operating room (OR), the patient was placed in the appropriate table, answered questions made by the nurse from the surgical safety checklist, and received anesthetic induction. She was then submitted to orotracheal intubation, central venipuncture and left radial artery puncture for invasive monitoring of blood pressure.



Figure 1. Abrasion injury in infra-umbilical area after removal of post-cardiac catheterization compression dressing with surgical tape.



Figure 2. Abrasion injury on inner right thigh after removal of post-cardiac catheterization compression dressing with surgical tape.

After the procedures carried out by the anesthesia team, including prophylactic antibiotic therapy, the nurse uncovered the patient to perform urinary catheterization and prepare the skin. At this point, he came across the extensive lesion. The team discussed the situation and decided to proceed due to the risk-benefit ratio, as assessed by the surgeon. In the instrument for registration of Systematization of Perioperative Nursing Care, the nurse found the entries about the preoperative visit and recorded the condition of the injury at admission in the room.

During positioning for cardiac surgery, the patients are usually wrapped in a strip of surgical tape, secured on the surgical table's ends. In other surgeries, Velcro straps and buckles can be used, but cardiac surgeries require asepsis of the entire torso and the surgical tape allows continuous application of the solution, unlike Velcro straps.

The skin was prepared with chlorhexidine antiseptic solution, followed by an alcohol solution. The nurse took care not to let the alcohol solution get in contact with the injured area, but applied the antiseptic solution on it, since there was no aqueous solution available. Between the first asepsis, performed by the nurse, and the second, done by the scrub nurse, the abdominal area received a layer of cross-sectional compress. Surgical tape was applied over the compress for safety in surgical positioning, ensuring no contact between it and the skin to prevent worsening of abrasions or the appearance of new ones.

The surgery lasted approximately four hours, with extubation in the OR. The patient was transferred to the cardiac surgery recovery unit with monitoring and without vasoactive drugs. Upon removal of surgical tape, new lesions were not found. At the end of the surgery, the injury edges and peri-incisional skin were hyperemic, probably due to the time they were kept in contact with the chlorhexidine solution.

After surgery, the adverse event was recorded. The patient had no surgical site infection (SSI) or other infectious complications during 11 days of hospital stay, until discharge.

DISCUSSION

The patient had risk factors for skin and positioning injuries – such as diabetes, advanced age, and obesity – which should have been given greater attention⁷. These factors must serve as a warning for strategies to prevent such injuries, including careful initial inspection of dermis condition and risks.

A strategy used by some nurses to protect the skin as much as possible is to first place a layer of micropore tape over the post-catheterization or angioplasty compression site and only then cover it with the surgical tape. This prevents epidermal contact and facilitates the removal. Important to note that we did not find studies in the literature that validate this resource.

One cannot affirm that the hemodynamic staff failed upon checkout, that is, the evaluation of the patient before leaving the procedure room, because she was discharged from the service to the emergency, where the dressing was removed^{8,9}. We also did not find reports of abrasion lesion after this procedure in the literature.

An integrative review verified the prevalence of 27 nursing diagnoses in hemodynamic services. However, it did not show diagnoses of “risk for impaired skin integrity” or “risk for impaired tissue integrity”, both applicable in complications. The former is useful to describe skin abrasion injury and the latter to refer to complications such as hematomas¹⁰. Despite the nursing diagnosis of “risk for impaired skin integrity” in post-catheterization patients, another study points out that the exam was mentioned because it can be used for any dermal invasion, without considering abrasion risk¹¹.

A publication reported the experience of a service with the use of a checklist designed for diagnostic and therapeutic cardiac catheterization procedures as a strategy for nursing care management. It showed to be an improvement in assistance quality, suggesting that it is possible to use this tool until dressing removal, when the staff assesses the possibility of complications at the puncture site that would hardly be noticed before¹².

Timeout, or patient safety checking immediately before skin incision, is still a challenge for nurses in SC. It should include an overall assessment of the patient, with records of previous skin injuries and review of strategies to prevent new

and surgical-positioning lesions^{7,8,13}. Demands such as room preparation, surgery delays, and team collaboration hinder this step^{8,14}. In the case presented, only after intubation and invasive procedures did the nurse identify the lesions.

An integrative review aimed at addressing nursing care in surgical positioning and reporting complications did not describe non-use of surgical tape as care strategy, although it is still used in some surgeries, mainly to ensure patient safety while moving the table for lateral tilt, head or lower-limbs elevation during surgery, or when the patient is accommodated in such positions⁷. The SC where the event occurred has Velcro straps and buckles available for this purpose; however, some teams prefer surgical tapes.

At the end of the surgery, the occurrence was registered in the hospital’s computerized surveillance of adverse events. Healthcare professionals should incorporate this procedure into their routine, given that, in spite of the large number of adverse events reported in some studies, results may be underestimated when there is no organizational culture to promote adherence to records¹⁵.

FINAL CONSIDERATIONS

Post-catheterization compression dressing is necessary, and the nursing staff must give special attention to its removal due to the risk of abrasion injury. This lesion can affect a large area, causing direct damage to the patient and increasing risks of infection, as described in the patient this study focused on.

We suggest the establishment of protocols to prevent skin injuries for both hemodynamic services and surgical centers. Lastly, emphasis is given to the importance of recording adverse events for further analysis of failures, proposal of interventions, and constant reflection about protocols and institutional routines.

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