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Case Report

Glans Necrosis Following Prone Position for COVID-19 Treatment in Patients with Penile Prosthesis

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Abstract

COVID-19 disease has been responsible for millions of hospital admissions, many of them requiring mechanical ventilation. Prone positioning is an adjuvant treatment in patients with refractory hypoxemia and is related to many complications such as pression-induced ulcer, soft tissue damages and peripheral nerve injuries. We report two cases of glans necrosis and spontaneously extrusion of semi-rigid penile prothesis in Intensive Care Unit (ICU) patients who required prone position. We hypothesized that these complications were mostly a consequence of a pression-induced ulcer because of the semi-rigid nature of the penile prothesis. We believe that this article could motivate changes in protocols intending to prevent pressure-induced ulcers giving attention for the possible presence of a penile prothesis and its possible harms during prone position.

Introduction

The severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), responsible for COVID-19 disease, has been responsible for millions of hospital admissions around the world, many of them in the Intensive Care Units (ICU) [1]. In most cases, COVID-19 patients admitted to the ICU present with severe and frequently fatal respiratory disease, requiring invasive mechanical ventilation [2]. Prone positioning is an adjuvant treatment in patients with refractory hypoxemia, used in about fifty percent of patients with Acute Respiratory Distress Syndrome (ARDS) caused by COVID-19 infection [3]. It has been shown that putting patients with refractory hypoxemia in prone positioning, for twelve to sixteen hours a day improves mortality and some key physiologic parameters [4-6]. Nevertheless, prone positioning may be associated with several complications, including a higher risk of pressure-induced skin and soft tissue injury [7]. The presence of a semi rigid penile prosthesis might be overlooked in these cases, probably due to the low proportion of patients with these devices among the general ICU population. However, the proportion of individuals with penile prosthesis might be higher among elderly people with underlining cardiovascular comorbidities or diabetes mellitus, which are precisely the subgroup most reached by the severe forms of COVID-19. We report herein two cases of glans necrosis and spontaneous extrusion of penile prothesis in critically ill patients who required prone positioning in the scenario of SARS-CoV-2 severe infection.

Case 1

A 67-year-old man, obese, with a history of prostate cancer, diabetes mellitus and arterial hypertension was diagnosed with COVID-19 on November 5th, 2020. The patient had been submitted to a semi-rigid penile prosthesis implantation 20 years ago, to treat an erectile dysfunction probably secondary to the diabetic vasculopathy. After a week with mild symptoms and out-of-hospital follow-up, his clinical condition deteriorated, and the patient was admitted to our Institution on November 13th. Three days later, he was transferred from the ward to the ICU due to respiratory failure, needing prompt orotracheal intubation and invasive mechanical ventilation. The patient developed

refractory hypoxemia and was put in prone position as a rescue therapy. Concomitantly, his hemodynamic condition deteriorated, with requirement of increasing doses of vasoactive drugs. On December 1st, the urology team was called to evaluate a glans penis lesion observed during the ICU treatment and evidenced a necrotic lesion with 2 cm of diameter, with no sign of infection or secretions, suggesting aseptic necrosis. The penile prosthesis was well positioned with no sign of fractures or extrusions. It was recommended local care with daily cleaning and bandage. Four days later, the prosthesis spontaneously extruded. The material was collected and sent to microbiological culture. Additionally, a local debridement was performed. The wound course was uneventful with progressive improvement in the following weeks. However, on January 8th, 2021, about one month later, the patient progressed with severe hypotension refractory to vasoactive drugs and, unfortunately, died. A complicating nosocomial infection was considered the most probable cause of death.

Case 2

A 67-year-old man, with a past medical history of arterial hypertension, diabetes mellitus and chronic coronary artery disease was admitted to the emergency room of a small city hospital on March 25th, 2020 presenting dyspnea and diarrhea. He progressed to respiratory failure and need of orotracheal intubation with invasive mechanical ventilation within the following twelve hours. The patient had been submitted to implantation of a semi-rigid penile prosthesis a few years ago to treat a severe erectile dysfunction supposedly secondary to diabetes mellitus associated vasculopathy. He was transferred to the ICU of our institution on March 27th and had the diagnosis of SARS-CoV-2 infection confirmed at the same day. Shortly after, he progressed with refractory hypoxemia and was submitted to a trial of prone positioning, with good response and repeated the strategy in the three subsequent days. On the April 5th, the urology team was called to evaluate a necrotic lesion of 1cm of diameter on the glans penis, suggestive of aseptic necrosis. The penile prosthesis was well positioned with no sign of fractures or extrusions. It was recommended local care with daily cleaning and bandage. The patients had a favorable clinical course and was extubated three days later, being transferred to the ward afterwards. The glans lesion became progressively worse despite adequate local care (Figure 1). The penile prosthesis was spontaneously extruded, with requirement of surgical debridement and a partial penectomy (Figure 2). The post-operative period was uneventful, and the patient was discharged to home on May 9th, 2020, 45 days after hospital admission.

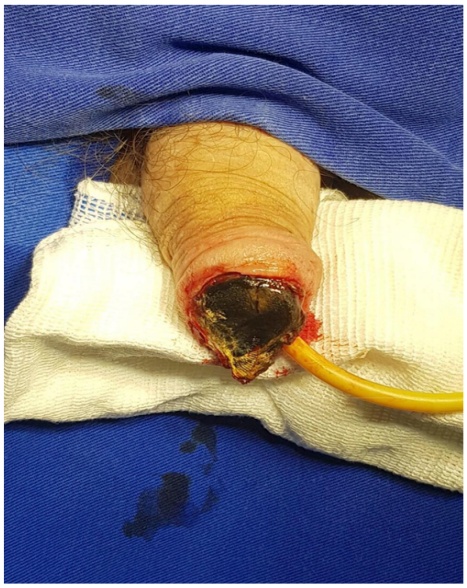

Figure 1: Necrotic lesion of 1cm of diameter on the glans penis, suggestive of aseptic necrosis.

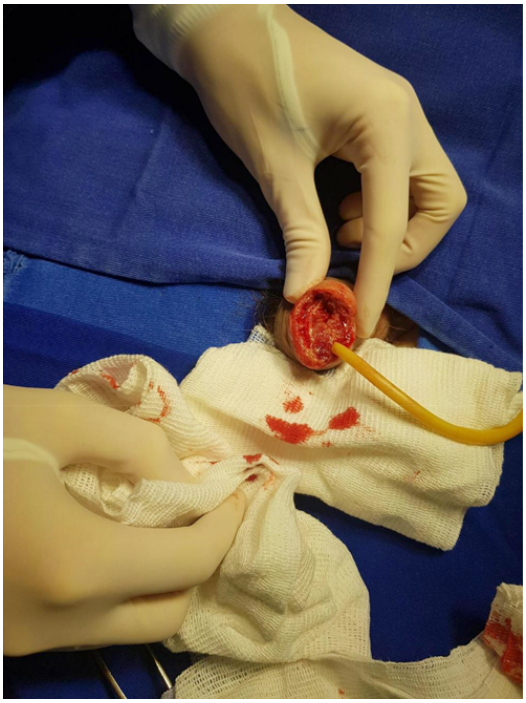

Figure 2: Surgical debridement and a partial penectomy final result.

Discussion

In this paper we reported two cases of glans necrosis and spontaneous prothesis extrusion in ICU patients with severe COVID-19 disease, who required mechanical ventilation and prone position to treat refractory hypoxemia. Glans necrosis is an unusual complication, even though health care providers must be aware of its existence in order to prevent it. The severe presentation of COVID-19 disease is associated with high morbidity and mortality of around 70-80% among the subgroup of patients requiring invasive mechanical ventilation. Many complications related to the intensive care treatment has been described in these patients, enhancing the COVID-19 related morbidity. For instance, Orgill and cols. reported a substantial enlargement on the incidence of Medical Device–Related Pressure Injuries during the COVID-19 pandemic, mainly in patients who require prone position. Kappel and cols. et al report a case of Fournier gangrene possibly related to prone positioning. In a cohort published by George R. Malik was reported a high rate of peripheral nerve injury in patients who required prone positioning. It was observed a incidence of 14,5% , much higher than the 0.14% incidence observed in studies about the incidence of perioperative peripheral nerve injuries .

The prevalence of patients with penile prosthesis might be higher among individuals admitted to the ICU with SARS-CoV-2 infection, since the main risk factors for erectile dysfunction, such as diabetes and cardiovascular disease, overlaps some of the known conditions predisposing to the severe forms of COVID-19. However, despite the protocols intending to prevent pressure-induced skin and soft tissue injury among critically ill patients [8], no mention is made to the possible presence of a semi-rigid penile prothesis. We hypothesized the glans necrosis observed in the two cases related herein were due to the prosthesis-induced pressure, as both patients required mechanical ventilation and stayed long periods in prone position. Many others mechanism might have contributed to this complication, such as reduction of the tissue perfusion caused by hemodynamic shock and high dose of vasoconstrictors, small vessel thrombosis [9]. Further studies are warranted to better clarify the mechanism of glans necrosis in patients with semi rigid penile prosthesis. In order to prevent penile prosthesis-related complications in critically ill patients, notably in those undergoing prone positioning ventilation, the penis should be maintained in the anatomical position, pointing upwards. As the prothesis are semi-rigid, it could damage the tissue as bone prominences do, so, reducing pression in the penis is a key strategy to decrease the risk of complications. To the best of our knowledge, this is the first report on glans penis necrosis and spontaneous penile prosthesis extrusion during the treatment of COVID-19. Health care providers could not overlook the presence of a semi-rigid penile prosthesis in patients underwent to prone position, mainly if this therapy is used for long periods of time. As demonstrated in our two patients, at least in patients with semi-rigid penile prosthesis, prone positioning can result in glans necrosis, loss of the device and even necessity of partial penectomy.

Conclusion

We believe that this article could motivate changes in protocols intending to prevent pressure-induced ulcers giving attention for the possible presence of a penile prothesis and its possible harms during prone position.

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