

Meralgia Paraesthetica after Prone Position Ventilation in a Patient with COVID-19

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ABSTRACT

Background and objectives: One of the most feared complications of COVID-19 is respiratory failure caused by acute respiratory distress syndrome. In order to improve oxygenation and survival, patients admitted to intensive care units and intubated may undergo prone position mechanical ventilation. Prolonged prone positioning may cause meralgia paraesthetica due to lateral femoral cutaneous nerve entrapment between the inguinal ligament and the anterior superior iliac spine. Reports of the first two cases have been recently published.

Case presentation: We describe the case of a 52-year-old man with respiratory failure during COVID-19 infection, who underwent prone position ventilation for 16 hours a day over 19 days and developed persistent burning pain and dysaesthesia on the lateral surface of the thigh bilaterally, diagnosed as meralgia paraesthetica.

Conclusion: This is the second report describing meralgia paraesthetica following prone position ventilation in COVID-19. Given the ongoing pandemic and the inevitability of more patients with severe respiratory distress requiring prone position ventilation, this disabling entrapment condition should be considered and possibly prevented.

LEARNING POINTS

- COVID-19 may require intubation and mechanical ventilation because of respiratory distress.
- Prone position ventilation improves oxygenation, but may cause lateral femoral cutaneous nerve entrapment and meralgia paraesthetica.
- Medical personnel should be aware of the risk of meralgia paraesthetica as a disabling condition potentially affecting more patients as the COVID-19 pandemic persists.

KEYWORDS

Meralgia paraesthetica, prone position ventilation, COVID-19

INTRODUCTION

Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), can have various clinical presentations, ranging from fever, cough and dyspnoea to pulmonary oedema, multi-organ failure and acute respiratory distress syndrome (ARDS). The prevalence of ARDS among COVID-19 patients has been reported to be up to 17% and admission to an intensive care unit (ICU) for mechanical ventilation is often required^[1]. In the management of COVID-19 patients with ARDS, the prone position is frequently used to improve oxygenation and survival, as recommended by the World Health Organization^[2].

Meralgia paraesthetica (MP) is a mono-neuropathy due to compression (entrapment) or injury of the lateral femoral cutaneous nerve (LFCN). This is a sensory nerve originating from the second and third lumbar roots and innervating the anterolateral surface of the thigh, from the level of the inguinal ligament almost to the knee. The nerve enters the psoas muscle, passes through the iliacus and reaches the thigh by passing through the two insertions of the lateral part of the inguinal ligament into the anterior superior iliac spine (ASIS). Entrapment can occur at the point where the nerve passes between the fork formed by the two insertions of the lateral part of the inguinal ligament into the ASIS. MP is characterized by neuropathic pain, hyposensitivity and dysaesthesia in the anterolateral thigh, without motor involvement. MP can be associated with diabetes mellitus, lead poisoning, alcoholism, hypothyroidism and mechanical causes including external direct pressure from tight belts and restrictive clothing or increased intra-abdominal pressure from obesity, pregnancy or tumours. Among the iatrogenic causes, prone positioning during spinal surgery has been reported^[3,4]. In addition to spinal surgery, MP has been described in a single patient with ARDS induced by *Legionella pneumophila* after prone position ventilation^[5], and very recently two COVID-19 patients with MP after prone position ventilation have been reported^[6].

Here, we discuss the third COVID-19 patient described in the literature, who developed MP after many hours of prone position ventilation. The present study has been carried out in accordance with the code of ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans.

CASE DESCRIPTION

A 52-year-old man was admitted to hospital for fever and dyspnoea. He had a medical history of well-controlled hypertension (home therapy with ramipril and doxazosin) and previous L5–S1 decompression surgery in 2005, with no post-operative complications. He denied alcohol abuse and cigarettes smoking. His body mass index was normal (22). COVID-19 infection was confirmed by a SARS-CoV-2 positive nasopharyngeal swab. Soon after admission, non-invasive ventilation (NIV) was started. A chest x-ray revealed infiltrates in the right lower lobe.

On day 3, because of clinical worsening, was admitted to ICU and underwent mechanically assisted ventilation. The patient received antiretroviral therapy and tocilizumab. On day 21, prone-supination cycles were started (16 hours of pronation and 8 hours of supination) and continued until day 39, when the patient was extubated. In the following days, the patient complained of burning pain and dysaesthesia on the lateral surface of the thigh bilaterally. Consequently, after a neurological consultation, he underwent a lumbo-sacral MRI, which showed an L4–L5 disc herniation pressing on the dural sac.

One month later, on day 69, the patient was admitted to the neuro-rehabilitation unit. On admission to the unit, he had bilateral muscle weakness of the dorsal extensor muscles of the foot, most evident in the right side. Walking was uncertain and difficult, and only possible with the aid of a walker. In addition, the patient had bilateral hypoesthesia affecting the anterolateral surface of the thigh, associated with burning dysaesthesia. Bilateral MP was suspected. The diagnosis was confirmed with a nerve conduction study showing that nerve action potentials of the LFCN could not be obtained on either side. Electromyography (EMG) from the quadriceps muscle showed no signs of denervation, suggesting no involvement of the lumbar plexus.

On day 87, the patient was discharged home. He was able to walk without aid. Hypoesthesia and burning dysaesthesia of the antero-lateral surface of the thigh were still present bilaterally.

DISCUSSION

In the ICU, mechanical ventilation in the prone position has been used for decades to improve oxygenation. However, to our knowledge, in the pre-COVID-19 era, MP after prone position ventilation was reported in only one patient [5]. This probably reflects an overall low number of patients who developed MP after prone position ventilation and a substantially mild clinical picture, with complete recovery within weeks.

In the COVID-19 era, the situation might change dramatically. The number of patients undergoing ventilation in the prone position has risen and the number of hours during which the patient is kept in the prone position has also increased. As a result, 10 months after the start of the pandemic, three patients with MP after prone position ventilation have already been described (including the present case report).

This is the first report of a COVID-19 patient with bilateral MP following prone position ventilation.

The clinical severity of MP after prone positioning most likely depends on the overall length of time spent in the prone position, as found after spinal surgery^[3]. In the two recently published cases with COVID-19, the patient who remained pronated for 42 hours developed a more severe clinical picture than the patient who remained prone for only 16 hours^[6]. Our patient was pronated for a much longer time, which contributed to his disability when he was discharged home. The results of the electro-diagnostic study showing the bilateral absence of nerve potentials are in line with the severity of his disability.

At this stage of the pandemic, we believe that it is important to highlight the side effects of a life-saving intervention (i.e., prone positioning), which may be used extensively in the near future. The present case report suggests that special care should be taken to limit LFCN compression in COVID-19 patients during prone positioning for mechanical ventilation, especially in patients with more severe disease requiring prolonged treatment.

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