whereas these symptoms are not typically observed in myositis.\textsuperscript{8}
In this patient, anti-AChR antibody and anti-MuSK antibody test results were negative. Also, repetitive nerve stimulation tests did not reveal waning and waxing, and the edrophonium test result was negative. These results can make it difficult to diagnose MG. Vallet et al.\textsuperscript{3} and Haddox et al.\textsuperscript{4} reported that patients with advanced melanoma with pembrolizumab-induced myositis developed ptosis. The observations in these cases are similar to those in our case. ICIs, including pembrolizumab, can induce aberrant immune activation leading to undesired off-target inflammation and autoimmunity by blocking regulatory checkpoints\textsuperscript{9}, therefore, irAE will not present with typical symptom of each disease as in our patient.

Pembrolizumab-induced rhabdomyolysis with myositis in our patient was administered systemic prednisolone. Vallet et al.\textsuperscript{3} and Haddox et al.\textsuperscript{4} used plasma exchange in addition to systemic corticosteroids. Zimmer et al. either used systemic corticosteroids or did not administer additional treatments.\textsuperscript{7} At present, there is no consensus regarding therapeutic options and treatment duration for pembrolizumab-induced myositis. Therefore, we must closely examine treatment in each case.

In several previous reports, irAEs, including skin reactions and thyroid dysfunction, were associated with a better therapy response.\textsuperscript{10-12} However, irAEs induce potentially long courses of corticosteroids and even anti-tumor necrosis factor therapy to mitigate effects.\textsuperscript{3} Furthermore, irAEs result in permanent discontinuation of treatment, long-term sequelae, and death.\textsuperscript{13} Our patient achieved good clinical response to pembrolizumab; however, pembrolizumab-induced irAE deteriorated performance status. Therefore, it is critical to closely monitor patients treated with ICIs for early detection and appropriate management of irAE, which will not present with typical symptom of each disease as in our patient.

References

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in the segment was inflated, in order to prevent hemorrhage. The procedure was repeated in the left upper lobe (B4) using a second bronchial balloon, being the first one left inflated in the B9. Only moderate bleeding was verified, controlled with bronchial occlusion and instillation of ice-cold saline. Three lung samples were obtained from the left lower lobe and 2 from the left upper lobe. After deflation of the bronchial blocker balloons and confirmation of absence of bleeding, the procedure was given as concluded. After 2 h the chest radiograph revealed a marginal left pneumothorax, considered without indication for chest tube drainage (Fig. 1A). The patient was admitted for vigilance and the subsequent exams showed a pneumomediastinum, small volume bilateral pneumothorax and exuberant subcutaneous emphysema (Fig. 1B and C). An enlarged area along the B9 segmental bronchus suspicious of a bronchus laceration was also evident (Fig. 1C). The patient was polipneic, but alert and oriented, hemodynamically stable and with oxygen saturation with a high flow oxygen mask of 97%. After discussion among Pulmonology, Intensive Care and Thoracic Surgery physicians, it was decided an initial conservative treatment in an intermediate care unit. The clinical evolution under conservative management was favorable, with progressive improvement. After five days the chest radiography had no longer the previous mentioned changes (Fig. 1D), the patient was asymptomatic and was discharged. The histology of the biopsy was consistent with a chronic hypersensitivity pneumonitis and the patient was started on corticosteroids.

The diagnostic approach of DPLD requires in many cases of histological support. Surgical biopsy has an associated mortality rate of 2.3–2.7%, contrasting with 0.3–0.5% of pulmonary cryobiopsy.\textsuperscript{1,2} Transbronchial cryobiopsy, although described with a diagnostic yield lower than SLB (84.4% versus 91.1% respectively, according to Sharp et al.\textsuperscript{4}), has been used as an alternative method, prior to surgical approach or in cases where surgical lung biopsy is a concern due to comorbidities, severely impaired lung function or patient refusal. Notwithstanding, despite being a less invasive technique, TBC is not devoid of life-threatening complications.

The most frequent adverse event related to this technique is pneumothorax, reported in up to one-fourth of cases in some series.\textsuperscript{1,5} Bleeding is another frequently described complication, normally controlled with prophylactic bronchial blockade and instillation of ice-cold saline. However, some severe bleeding cases requiring surgical intervention, transfusion or admission to the intensive care unit have been reported.\textsuperscript{1} Other reported adverse events are prolonged air leak, acute exacerbation of the underlying interstitial lung disease, transient respiratory failure, seizures and pulmonary abscess.\textsuperscript{1,6,7} Although pneumothorax is the most frequent described adverse event, to our knowledge this is the first reported case of concomitant bilateral pneumothorax and pneumomediastinum complicating this technique.

Lateral basal bronchus laceration was probably the factor that led to these complications. The bronchial blocker balloon left inflated under high pressure in the left 9th segmental bronchus possibly caused a bronchial laceration that was left unnoticed after its deflation. Another possible explanation could be an area of bronchial fragility where the balloon inflated, leading to a laceration. Some studies suggest a higher incidence of pneumothorax and other adverse events in intubated patients and when jet ventilation was used.\textsuperscript{3,9} It is uncertain whether the performance of this cryobiopsy in our intubated patient, using jet ventilation, was also a factor contributing to the magnitude of the reported complications. Besides, the biopsies in 2 lobes may have also played a role.

Conservative treatment of bronchial lacerations may be an option with a high probability of success in some patients, especially those with iatrogenic tracheobronchial injury.\textsuperscript{10} Regarding
the pneumomediastinum treatment, the tissues in the mediastinum will slowly resorb the air in the cavity so most pneumomediastinums are treated conservatively, with measures toward symptom relief.\textsuperscript{11} This was the case of our patient, whose clinical evolution under conservative management was favorable, with progressive clinical and radiological resolution.

Given the growing importance of TBC, which might soon be integrated in the routine diagnostic workup of patients with DPLD, it is important to report these severe adverse events attempting to limit them. We believe that standardization of this technique is warranted in order to minimize complications.

References


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