

Pneumorachis, A Rare Post-Traumatic Complication

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DOI: [10.36347/sjmcr.2023.v11i12.015](https://doi.org/10.36347/sjmcr.2023.v11i12.015)

| Received: 05.11.2023 | Accepted: 08.12.2023 | Published: 18.12.2023

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Abstract

Case Report

The presence of air in the spinal canal defines pneumorachis, which is a rarely reported entity; exceptionally, it is found during a road traffic accident (MVA). We present the case of a 36-year-old patient who suffered an MVA. The work-up showed multiple fractures of the cephalic extremity, pneumocephalus, pulmonary contusions, pneumomediastinum, moderate bilateral hemopneumothorax, thoracic vertebral and costal fractures and moderate cervicothoracic pneumorachis. Spinal lesions are thought to be the cause of this pneumorachis. Lesions of the parietal pleura and meninges are thought to be responsible for air escaping from the pleural space into the spinal canal from D2 to D7. Although rare, the literature reports similar observations of post-traumatic pneumorachis. The diffusion of air bubbles into the spinal canal is a direct consequence of the rupture of a solid organ and a spinal lesion. The discovery of air bubbles should therefore prompt a search for other lesions that may explain their formation.

Keywords: spinal canal, pneumocephalus, post-traumatic pneumorachis.

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1. INTRODUCTION

Pneumorachis is often reported as a complication of neurosurgery, anaesthesia or secondary to a ruptured epidural abscess. The presence of air in the spinal canal is rarely secondary to closed trauma [1, 2]. We report a case of pneumorachis secondary to a road traffic accident, diagnosed by computed tomography (CT).

2. OBSERVATION

A 36-year-old man with no previous history of any kind suffered a thoracic closed impact trauma following an MVA. The chest X-ray showed a medium-sized bilateral fluid effusion and fractures of the posterior costal arches of the last left ribs. The computed tomography (CT) scan showed a large amount of pneumocephalus, facial fractures, fractures of the

spinous processes of C4, C5 and C6 and left transverse processes of C7 and D1, dissecting emphysema of the lower cervical soft tissues, the presence of air in the spinal canal from C1 to D2, and a small amount of bilateral pneumothorax, small to moderate pneumomediastinum, moderate bilateral haemothorax, pulmonary parenchymal contusions, fractures of the posterior arches of the last four left ribs, fractures of the left transverse processes of D2 to D7 and of the superior marginal listel of D9 without posterior wall recession (Fig. 1,2). There was a deep splenic laceration of more than three centimetres, sparing the hilum, classified as AAST grade III, a subcapsular haematoma and spleno-renal space. There was no intracranial haemorrhage or extravasation of contrast medium outside the large thoracic vascular trunks. The subsequent course was marked by the development of an acute respiratory distress syndrome.

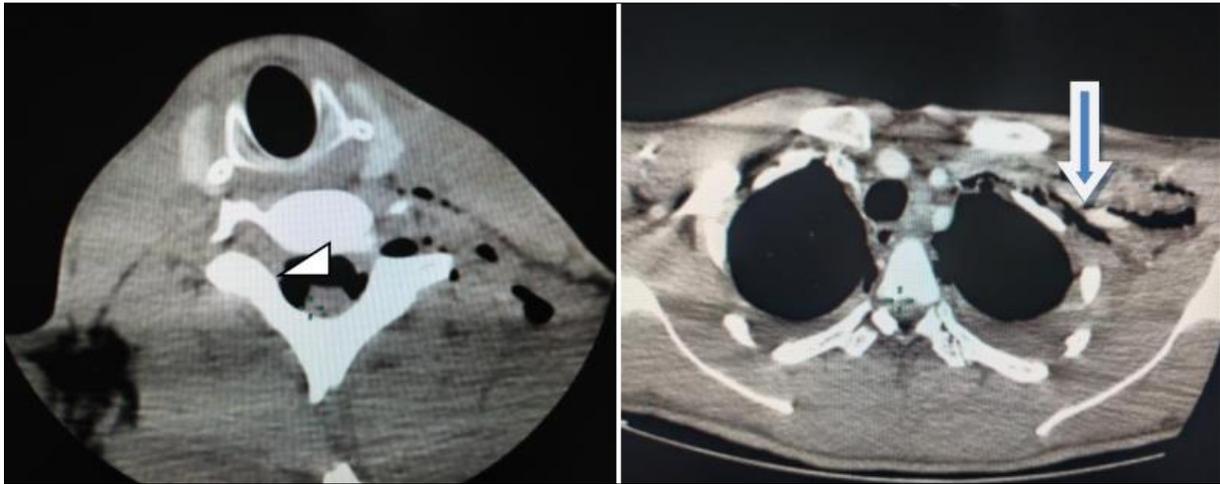


Figure 1: Lower cervical axial sections showing subcutaneous emphysema lateralized to the left (arrow), with the presence of air bubbles within the spinal canal (arrowhead)



Figure 2: sagittal and coronal sections showing the presence of intracranial air bubbles extending into the spinal canal at cervical and thoracic levels (arrows)

3. DISCUSSION

The presence of air in the spinal canal, defining the pneumorachis, is a rare entity, the traumatic origin of which is exceptional. It is most often extradural and extends into the subarachnoid space after invasion of the dura mater. This complication has been described in the cervical region as an extension of post-traumatic pneumocephalus with fracture of the base of the skull or the facial sinuses [3-6]. Thoracic trauma is also responsible for pneumothorax and/or pneumomediastinum [1-5]. In our case, we found the mechanisms reported in the literature [5]. In our case, CT confirmed pneumomediastinum, skull base fractures and pneumocephalus. Bronchial and digestive fibroscopy were not performed. Air from the pleural space was said to have entered the epidural space. This lesion mechanism has been found in a few studies which have in common the lesion of a hollow organ or the existence of lesions facilitating air entry: association of a haemopneumothorax, rib fractures, vertebral fractures, pneumorachis and pneumocephalus [10]. The suspected

mechanism of injury is closely related to the findings in three cases reported in the literature [2-8].

One team reported the observation of a patient who had suffered a thoracic trauma resulting in paraplegia, haemothorax, rib fractures, a fracture of D10 and pneumorachis with a herniation of the right lung into the medullary canal via a hole of conjugation [2]. Intraoperative diagnosis of dural rupture in a patient with closed chest trauma, vertebral fractures and pneumorachis [7]. The case of a 73-year-old patient, victim of a road traffic accident, with bilateral haemopneumothorax, a D11-D12 dislocation fracture and thoracic pneumorachis has also been reported [8].

4. CONCLUSION

Post-traumatic pneumorachis is a rare entity. If it is found in a trauma patient, further investigations should be carried out to look for other lesions, in particular those that may account for the formation of this gaseous collection, such as pleuropulmonary lesions, fractures of the base of the skull or vertebral fractures.

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