

Non Traumatic Pneumorrhachis Associated with Gas Forming Infection of the Abdominal Wall Muscles due to Poorly Controlled Diabetes Mellitus: A Rare Phenomenon

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Abstract: Pneumorrhachis, the presence of intraspinal air, is rarely described in the literature. Because of its rarity, evaluation of this condition is not fully understood. Non traumatic pneumorrhachis is a very rare phenomenon and mostly associated with violent coughing or bronchial asthma. Herein we describe a case of pneumorrhachis due to gas forming infection of abdominal wall muscles and fasciae associated with poorly controlled diabetes which to the best of our knowledge has never been reported in the literature so far.

Keywords: Pneumorrhachis, Computed Tomography, Diabetes Mellitus

INTRODUCTION

Pneumorrhachis is defined as air localized within the spinal canal: in the extradural space, in the intradural space or in the subarachnoid space. It is a rare condition, usually incidentally detected during radiological investigations [1]. Intraspinal air is usually found isolated not only in the cervical, thoracic and, less frequently, the lumbosacral regions but can also be located in the entire spinal canal [2]. Pneumorrhachis is usually an asymptomatic phenomenon but also can be symptomatic.

Common causes of pneumorrhachis include penetrating trauma; an invasive procedure like an epidural analgesia or a lumbar puncture; spontaneous or traumatic pneumomediastinum and pneumothorax; degenerative disc disease; or extradural abscess [3]. Non traumatic pneumorrhachis is rare phenomenon and its association with gas forming infection due to diabetes mellitus has never been reported. We herein report a case of non traumatic pneumorrhachis due to gas forming infection in abdominal muscles and fasciae due to poorly controlled diabetes mellitus.

CASE REPORT

A 65 years old male presented to the hospital with chief complaint of mild pain in the back and flanks and fever for the last 15 days. No history of trauma, fall, asthma, breathlessness or violent coughing was present.

Physical examination revealed mild tenderness over the back muscles and flank regions.

Neurological examination and X-rays of abdomen were unremarkable. Blood examination revealed fasting blood sugar of 158 mg/dl and random blood sugar of 310 mg/dl suggestive of diabetes mellitus. Total leukocyte count was also raised with 85 % polymorphs on differential count. For further evaluation, a Computed Tomography (CT) of the abdomen was advised. CT scan revealed presence of air loculi in bilateral psoas, right iliacus and right erector spinae muscles suggestive of anaerobic infection (Fig. 1). Multiple air loculi were also seen in the dorsal and lumbar portions of spinal canal (Fig. 2) representing pneumorrhachis due to gas forming infection due to poorly controlled diabetes mellitus.

DISCUSSION

Free air surrounding the dura mater spinalis is an uncommon phenomenon that was primarily reported in 1977 by Gordon *et al.* [4]. The term pneumorrhachis was first coined 10 years later by Newbold and co-workers [5]. Pneumorrhachis per se usually represents an asymptomatic, probably underdiagnosed epiphenomenon of coincident underlying injuries and diseases [2].

Pneumorrhachis is an exceptional but eminent radiographic finding that is accompanied by different

aetiologies and possible pathways of air entry into the spinal canal [2]. Air within the spinal canal can be divided into primary and secondary pneumorrhachis, descriptively classified into extra- or intradural pneumorrhachis and aetiologically subsumed into iatrogenic, traumatic and nontraumatic pneumorrhachis [2].

Different causes of pneumorrhachis include trauma, respiratory complications, conditions that produce high intrathoracic pressure and barotraumas, recent iatrogenic manipulations during surgical, anaesthesiological and diagnostic interventions, malignancy and its associated therapy; also may occur spontaneously. In some cases, it is an accidental discovery and the cause remains unclear [2]. Pneumorrhachis due to anaerobic infection associated with diabetes mellitus has never been described in literature so far.

Primarily diagnosis of pneumorrhachis is done radio graphically, not clinically. The diagnosis of patients should include plain roentgenograms and CT scanning of the spine [2]. For early detection X-ray may be helpful and to detect larger amounts of intraspinal air [6, 7]. CT scanning is reliable and prompt tool for detection of pneumorrhachis [8-10]. However, intra and extradural pneumorrhachis may be difficult to differentiate by CT [6, 11, 12].

Pneumorrhachis usually is asymptomatic, does not tend to increase and resolves spontaneously and completely. Rarely, pneumorrhachis is symptomatic and associated with discomfort and pain or even neurological deficits.

Pneumorrhachis is thought to be associated with an increased morbidity and mortality. Therefore, the conditions causing pneumorrhachis has to be properly evaluated and be appropriately treated.

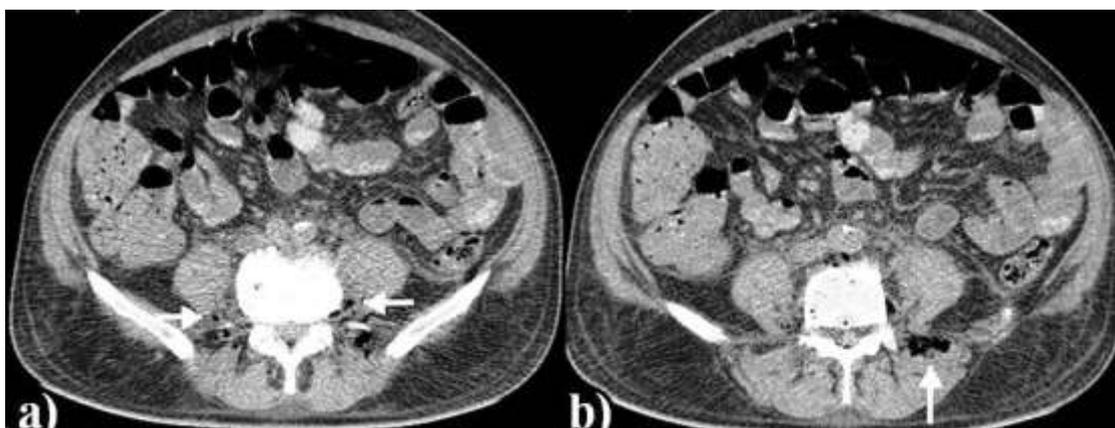


Fig. 1: Axial Non contrast CT images of the abdomen showing presence of air loculi in the bilateral psoas, left iliacus and left erector spinae muscles (white arrows)

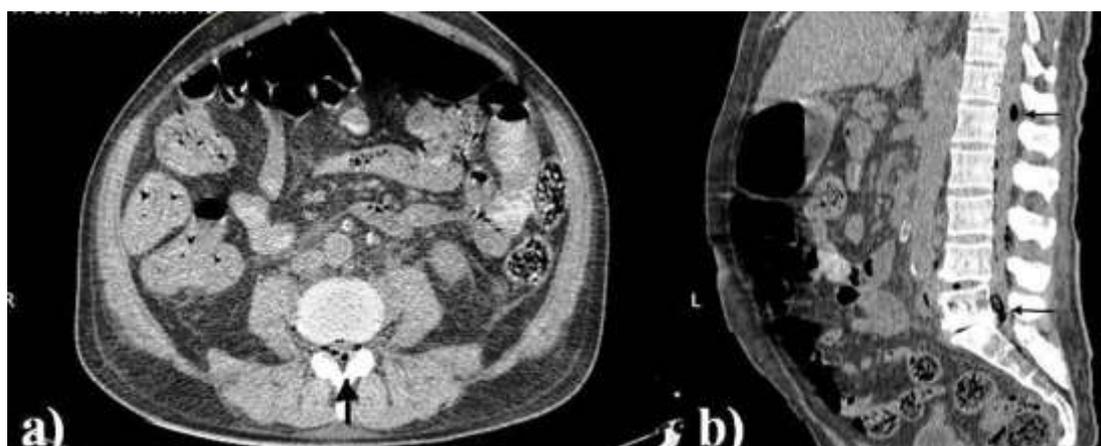


Fig. 2: Axial and Sagittal Non contrast CT images of the abdomen showing presence of air in the spinal canal (black arrows)

CONCLUSION

Pneumorrhachis can be caused by a variety of causes and the evaluation of pneumorrhachis could be a

diagnostic challenge. Although pneumorrhachis usually is self-limiting, prompt recognition and management of the underlying cause is essential. The attending spine

specialist has to carefully evaluate the associated pathologies leading to pneumorrhachis to enable adequate therapy.

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