

# Cervicofacial emphysema: a rare presentation of a nasal bone fracture

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## ABSTRACT

Cervicofacial subcutaneous emphysema is a rare complication of facial trauma. This presentation is commonly associated with multiple facial bone fractures, tooth extraction or airway injury. We report a case of extensive cervicofacial subcutaneous emphysema secondary to an isolated nasal bone fracture. Literatures showed that this is extremely rare presentation for nasal bone fracture.

**Keywords:** Emphysema, nasal bone, nasal bone fracture

## INTRODUCTION

Subcutaneous emphysema is a condition when air or gas entrapped in the subcutaneous tissue plane. This air or gas is usually collected in the loose and distensible layer of connective tissue and causing soft tissue distension.<sup>1, 2</sup> It is characterised by crackling sensation on palpation. The cause of this problem can be traumatic, iatrogenic or spontaneous.<sup>2</sup> Subcutaneous emphysema may occur in any part of the body but common sites are including face, neck and thorax as these areas are closed to respiratory and digestive tract. Cervicofacial subcutaneous emphysema is reported as rare presentation and usually related to maxillofacial trauma, respiratory tract injury or iatrogenic procedures

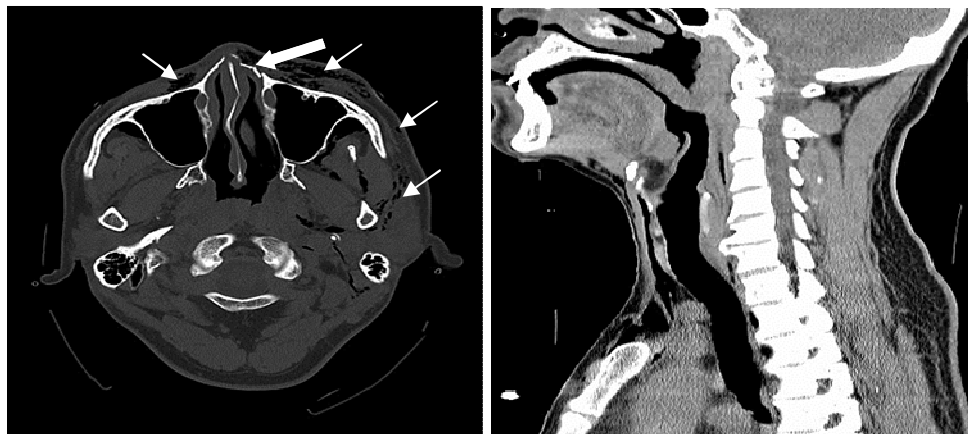
example from dental extraction, endoscopy or adenotonsillectomy.<sup>2, 3</sup>

## CASE REPORT

A 40-year-old Malay man presented after a fall from the stairs. In the fall, he hit his nose on the stair edge and sustained epistaxis from the left nostril. The epistaxis resolved spontaneously after few minutes of compression. However, to clear blood clots, he blew his nose vigorously to relieve the nasal blockage. Subsequently he developed swelling over his left eye which gradually spread down to the left face and the upper neck region. He had no visual disturbances, difficulty breathing, dysphagia or any voice change.

He came to the hospital as the swelling progressed. Examination showed the upper part of nasal bridge was swollen with 0.5 cm superficial wound. There was no active

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**Figs. 1: a) Axial computed tomography image showing a nasal bone fracture (large arrow) with multiple lucent areas (small arrows) within the subcutaneous tissue, extending from the left fronto-parieto-temporal scalp, bilateral periorbital region, bilateral extraconal space, bilateral infratemporal region, left parapharyngeal space and downwards to the superior mediastinum. Sagittal section of CT scan showed normal laryngeal frame.**

epistaxis or any nasal discharge was noted. The nose was tender and the nasal bone was mobile on palpation. The left peri-orbital area was swollen with the swelling extending inferiorly to the left face, anterior neck and the left supraclavicular region. Non-tender crepitus was felt over this swollen region. He was comfortable with no signs of respiratory distress. Examination of the eyes showed the left upper lid was slightly pushed down by the swelling. The eye movements, pupillary reflex and vision acuity of both eyes were normal. The conjunctiva was not injected. The oral cavity was normal and the pharyngeal wall was not medialised. There were no bruises or tenderness felt over the neck region. Laryngeal crepitus was present. He spoke in normal voice tone. Percussion over the lungs field detected no hyperresonance and there was no reduced air entry on auscultation.

Nasal endoscopy showed only anterior deviation of nasal septum with streak of blood in the left nostril. Both the osteomeatal complexes were not blocked. However minimal

medialisation of the left lateral nasal wall was observed. The nasopharynx showed no abnormality.

Flexible nasopharyngolaryngeal scope showed normal larynx and hypopharynx. The airway inlet was not compressed and both vocal cords were normal in adduction and abduction movement.

Computed tomography scan (Figure 1) showed extensive subcutaneous emphysema over the left fronto-parieto-temporal scalp region, bilateral periorbital space, bilateral extraconal space, bilateral infratemporal region and prevertebral space. The lesion extended downward to the superior mediastinum. There was only nasal fracture was identified from the scan. The other facial bones including the orbital walls were all intact.

Based on the examination and radiological findings, diagnosis of extensive cervicofacial subcutaneous emphysema secondary to nasal bone fracture was made. This patient

was admitted to ward for close observation. Subcutaneous emphysema slowly subsided with conservative management and completely resolved after 3 days. He was discharged home well and no further complications were seen.

## DISCUSSION

Subcutaneous emphysema following nasal bone fracture is rare. Most of the reported cases of cervicofacial subcutaneous emphysema were associated with trauma to the orbital walls, maxilla bones, laryngeal injury or following dental extraction. In our case, the mechanism leading to the emphysema was due to vigorous nasal blowing which increased the nasal cavity pressure to force air into subcutaneous tissue through the defect nasal bone. Literature showed that force from expiration, coughing, vomiting, nose blowing, sneezing and straining are able to push air to the subcutaneous layer through the bony defect.<sup>4</sup> The emphysema becomes potentially harmful when the soft tissue like fat becomes a one-way valve to avoid air from leaving the space.<sup>4</sup> Increasing trapped gas in orbital emphysema may impair the blood circulation and cause orbital compartment syndrome.<sup>5</sup>

Managing traumatic subcutaneous emphysema starts from proper history taking. Details regarding nature of trauma should be asked thoroughly. History of dental or surgical procedures and possible infection related symptoms also should be obtained during history taking. For patients with cervicofacial emphysema; swelling, pain, odynophagia, dysphonia and dyspnoea are common complaints.<sup>3</sup>

Physical examination should be direct-

ed towards identification of the cause, extension and severity of subcutaneous emphysema. The pathognomic crepitus on palpation is expected in most cases. In cases which involve the eyes, proper eye assessment is mandatory to identify serious complications like ischemic optic neuritis and central retinal artery occlusion which may lead to permanent visual loss.<sup>5,6</sup> Examination of upper and lower respiratory system also important to rule out causes related to lungs or upper respiratory tract. Proper chest auscultation and percussion may detect potentially harmful pneumo-mediastinum.<sup>3</sup> Early detection of serious causes or complications allows rapid and fast interventions.

Most of the cervicofacial emphysema cases are diagnosed base on clinical findings. Radiological studies are helpful to identify cause and severity of emphysema. Facial bone fracture and pneumothorax are simply detected from plain radiograph. CT scan is useful to detect the extension of the emphysema. For example, in the assessment of orbital emphysema.<sup>6</sup> Differential diagnosis for post trauma cervicofacial emphysema is hematoma, lymphedema or angioedema.

Subcutaneous emphysema is usually self-limiting.<sup>3</sup> Most do not require any intervention. However, admission is recommended for observation as it may progress to life threatening conditions such as tracheal compression, pneumothorax and fatal hypotension due to impaired venous return where early resuscitation is needed. Meanwhile, in cases with orbital emphysema which may potentially cause visual impairment, early surgical decompression is mandatory.<sup>4</sup> Steroids as anti-inflammatory is used in certain cases.

Even though controversial, broad spectrum antibiotics should be considered in cases which involve oropharyngeal connection.<sup>3, 4</sup>

Most literatures emphasise on avoidance of straining, sneezing, coughing or any strenuous exertion. Nasal decongestions can be used to clear blocked nose as preventive measures to reduce sneezing and nasal blowing. Use of nasal packing to prevent air leakage from traumatised nose to sinuses and subcutaneous tissue has also been reported.<sup>7</sup> Most of subcutaneous emphysema will resolve after 5-10 days.<sup>8</sup>

In conclusion, subcutaneous emphysema following nasal bone fracture is a rare presentation. The complications can be life threatening. Therefore, it is advisable to caution patient with nasal bone fracture to against nasal blowing to prevent this problem.

## REFERENCES

- 1:** Lee JY, Zovickian J, Wang K, Pang D. Subcutaneous cervical emphysema associated with mastoid fracture. *Child's nervous system* 2012; 28:489-49.
- 2:** Torgay A, Aydin E, Cilasun U, Durmaz L, Arslan G. Subcutaneous emphysema after dental treatment: a case report. *Pediatr Anesth* 2006; 314-7.
- 3:** Shine NP, Sader C, Coates H. Cervicofacial emphysema and pneumomediastinum following pediatric adenotonsillectomy: a rare complication. *Int J Pediatr Otorhinolaryngol.* 2005; 69:1579-82.
- 4:** Steven JK, Francine R, Simon H, Mehmet M. Orbital emphysema-the need for surgical intervention. *J cranio-maxillofacial Surg.* 2008; 36:473-6.
- 5:** Bhat M, Pinto GJO, Moras K, Concessao P. Think twice before you blow-case report and review of literature. *J Clin Diagnost Res.* 2010; 4:3558-60.
- 6:** Wang LT, Chen JT, Chang LW, Liu MY, Hsu CC, Hsieh DS. Massive orbital emphysema-an unusual clinical presentation of isolated medial orbital wall fracture. *J Med Sci* 2007; 27:271-4.
- 7:** Saray A. Unilateral facial emphysema secondary to a minor trauma. *Eur J Plast Surg* 2001; 24:259-60.
- 8:** Claudio AGV, Carlos AVP, Andrés AA. Subcutaneous emphysema secondary to dental treatment: Case Report. *Med Oral Pathol Oral Cir Bucal (Internet).* 2007;12 n.1 Madrid ene. 2007