CASE REPORT

CERVICOFACIAL AIR EMPHYSEMA: A RARE COMPLICATION OF ISOLATED MAXILLARY SINUS WALL FRACTURE

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ABSTRACT

Cervicofacial emphysema is rarely observed and has been reported in relation to dental surgical procedures, sequelae of surgical intervention in the upper aerodigestive tract, or orofacial trauma. This paper reports a case of cervicofacial emphysema developed with an isolated maxillary sinus wall fracture following a motor traffic accident in a 35 year old female.

Key words: Cervicofacial Emphysema; Pneumomediastinum; Maxillary Sinus Wall Fracture

Introduction

Cervicofacial emphysema is an infrequently reported sequela to dental surgery. Most cases result from the accidental introduction of air into the soft tissues during the use of air-driven, high-speed handpieces or air/water syringes. The clinical presentation is usually a facial or cervicofacial swelling coincident with the dental treatment. The use of air instruments, immediate onset, crepitus and often a radiographically discernible enlarged facial space are the diagnostic features. Pain is not usually a feature. The possibility of mediastinal involvement should be recognized and the patient monitored appropriately. Active treatment requirements are minimal. Reassurance of the patient, antibiotic prophylaxis and analgesics, if required, are generally sufficient. His paper reports a case of cervicofacial emphysema developed with an isolated maxillary sinus wall fracture following a motor traffic accident in a 35 year old female.

Case report

A 32 year old female patient reported to casualty with following a road traffic accident. Physical examination revealed Glasgow Coma Scale of 15 and no other injuries in the body other than emphysema over right supra orbital and buccal region. Computed tomography scans of midface showed isolated fracture of anterolateral wall with hemosinus of right maxillary antrum surrounded by air in buccal and circumorbital space (Figure 1,2). Patient was admitted and advised not to inhale or exhale air forcefully from nose or mouth. After 12 hours, patient developed bilateral facial swelling extending from supraorbital region to superior aspect of clavicles (Figure 3,4). Crepitus on palpation of the swelling was found which a classical sign of subcutaneous emphysema was. She reported dyspnoea, dysphagia and chest pain. No abnormalities were found on chest X-ray. Auscultation of the lung fields found breath sounds to be equal and clear bilaterally. The cardiovascular examination showed a regular rate and rhythm without the presence of murmur or rub, with a normal ECG.

Prophylactic antimicrobial therapy, consisting of intravenous antibiotics was initiated. The patient was shifted to Intensive care unit for any emergency air way management. Pan endoscopy was done to rule out injuries of trachea-bronchial tree or upper aero digestive tract. A conservative approach was followed for antral wall fracture and patient was kept under observation. The patient’s prognosis was good and she was discharged after five days. She continued follow-up appointments with complete resolution of the emphysema in approximately 10 days.

Discussion

The first case of subcutaneous emphysema was reported by Turnbull before 110 years ago, when a musician blew a bugle immediately after tooth extraction. Emphysema is a well recognized complication of fractures involving maxillary sinus but cervicofacial emphysema in isolated maxillary sinus wall fracture is a very uncommon complication. Subcutaneous emphysema with and without mediastinal spread has been described after other maxillofacial injuries such as zygomatico-maxillary complex fractures and mandibular fractures. Blunt trauma that results in disruption of the trachea-bronchial tree and oesophagus has been well documented as a factor in the development of pneumomediastinum, pneumomediastinum or emphysema of the neck. Many other sources of cervical and mediastinal emphysema have been well documented in the literature. Iatrogenic causes have included use of air turbine dental drills during almost all dental procedures. Spontaneous emphysema and pneumomediastinum has been documented after orthognathic surgery, transient episodes of respiratory obstruction, such as produced by valsalva’s maneuver, violent coughing and emesis.

The communication of the fracture site with the related fascial spaces ultimately leads to clinical presentation. The fascial spaces and the parapharyngeal space continue laterally into the perivisceral spaces. These spaces in the neck, as well as the retropharyngeal, vascular and pretracheal spaces are in direct communication with the mediastinal spaces of the thorax. Therefore, air under either positive or negative pressure may find its way from the fascial spaces down to neck and mediastinum. In this patient, the antral wall fracture resulted in air entrapment in buccal and orbital space, which further got worsened by inadvertently produced Valsalva like Maneuver forcing air through the antrum wall fracture. At this point the air flowed in a inferior and posterior direction through lateral pharyngeal spaces to enter deep spaces of the neck. Here the air spread to the contra lateral side of neck in both ante-
rior and posterior direction. Air in cervicofacial region is more likely to descend into mediastinum, which is a life threatening complication. The predominant symptoms of mediastinal emphysema include substernal pain, Hamman's sign (crunching sound with each heart beat), dyspnea, neck pain, dysphagia, dysphonia, puffy face and neck with crackle under the skin. This patient experienced one brief episode of chest pain which resolved without any specific therapy.

Treatment consideration of cervical and mediastinal emphysema begins with monitoring and maintaining a patent airway and intact Cardiovascular System. Significant cervicofacial emphysema can result in airway obstruction necessitating endotracheal intubation or tracheostomy. Avoidance of nitrous oxide in general anesthesia is mandatory to prevent worsening of pneumomediastinum or pneumothorax. The use of prophylactic antimicrobial therapy has been strongly encouraged by several authors especially in cases of trauma where potentially pathogenic bacteria from upper aerodigestive tract can be trapped in emphysematous air pockets in the neck and mediastinum which can further cause complications such as necrotizing fasciitis.

Conclusion
In conclusion the cervical and mediastinal emphysema usually resolve approximately from one to three weeks without any surgical intervention but the patient should have close follow-up in the resolution phase to allow for the timely diagnosis of any further complications.

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