

THE ROLE OF MULTISLICE COMPUTED TOMOGRAPHY IN THE EMERGENCY DIAGNOSIS OF THE TRACHEOBRONCHIAL INJURY AFTER ENDOTRACHEAL INTUBATION - CASE REPORT

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Tracheobronchial injury (TBI) is a rare complication occurring after endotracheal intubation. Treatment can be conservative for small lesions and when the patient's condition is stable, or surgical for bigger lesions and when pneumomediastinum and/or subcutaneous emphysema threaten the patient's life. Total thyroidectomy was performed in a 60-year-old woman with multinodular goiter. Ten hours after surgery, subcutaneous emphysema of the face and neck developed. A cervical and thoracic multislice computed tomography (MSCT) confirmed subcutaneous emphysema, pneumomediastinum, and posterior wall tracheal rupture 2cm in size. The patient was treated conservatively. The MSCT imaging can be a useful method for diagnosing the location and form of tracheal injury in hemodynamically stable patients. *Acta Medica Medianae* 2015;54(1): 53-55.

Key words: multislice computed tomography, endotracheal intubation, tracheobronchial lacerations

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Introduction

Tracheobronchial injury (TBI) is a rare complication occurring after endotracheal intubation. It can be caused by interlacing of mechanical, anatomic, and undefined individual factors. Treatment can be conservative for small lesions and when the patient's condition is stable, or surgical for bigger lesions and when pneumomediastinum and/or subcutaneous emphysema threaten the patient's life (1).

Case report

In this paper we presented a case of a 60-year-old woman with 6-year history of progressive enlarging of the mass in the anterior part of the neck. On examination, the patient was in no

distress; she was obese, with a body mass index 68.

Total thyroidectomy was performed through a collar incision, under general anaesthesia. The anesthesiologists described intubation as "difficult". The intubation was performed with an 8mm cuffed endotracheal tube. The cuff was inflated with 10ml of air. Surgery was uneventful.

Ten hours after surgery, subcutaneous emphysema of the face and neck developed. The patient was slightly dyspnoeic. Body temperature was 37°C. Systemic arterial pressure was 140/95 mm Hg, and the heart rate was 88 beats per minute. The impressive subcutaneous emphysema of the head, neck, and chest wall was present 14 hours after extubation. Auscultation of the thorax revealed normal heart tones, crackling crepitus, and bilaterally decreased breath sounds. A chest x-ray film confirmed the clinical diagnosis of marked subcutaneous emphysema and pneumomediastinum.

Cutis and subcutis of collar incision were open and temporarily closed with two sutures. Patient was transferred to the radiology department where multislice computed tomography (MSCT) scan was performed.



Figure 1. Sagittal MSCT scan of the patient

A cervical and thoracic MSCT scan (Figure 1) confirmed: subcutaneous emphysema, pneumomediastinum, and posterior wall tracheal rupture 2cm in size. As vital signs were stable and the air leak was well controlled by opening the wound, surgery was postponed, and conservative treatment with antibiotics was administered. On the tenth day, fiberoptic bronchoscopy showed the total closure of the tracheal laceration. Antibiotics were discontinued after two weeks. At the three-month follow-up the patient was asymptomatic. There was no evidence of tracheal stenosis on spirometry.

Discussion

In most cases, mechanisms for TBI are due to an over inflated cuff, or to sudden moves of the tube. These mechanisms explain the location of the lesions, which are posterior, mainly concerning the membranous wall of the trachea or the junction between the membranous wall and the cartilage (2).

In any case of suspected trachea rupture, the diagnostic procedures should include: clinical examination, X-ray of the chest and neck, followed by CT scans of these regions (3). The most

sensitive chest radiology features for airway rupture are pneumomediastinum and cervical emphysema. Extravasation of air into the mediastinum is expected with intrathoracic tracheal rupture, but the presence of pneumomediastinum is not pathognomonic for a tracheal rupture. CT allows the assessment of oesophageal leak, pneumomediastinum, and permits analysis of the volume of mediastinal fluid collection. Kunisch-Hoppe (4) suggests that routine thoracic CT scan does not provide sufficient evidence for tracheal rupture.

Tracheobronchoscopy is the mandatory examination so as to establish the diagnosis and to identify the anatomy to choose the appropriate treatment and approach. In spite of its important role, tracheal injuries can easily be overlooked with bronchoscopy because: blood and mucus accumulate in the injured trachea; poor condition of patients may not permit adequate examination by bronchoscopy, and the appearance of such injuries is unfamiliar (1).

In such cases we use MSCT imaging to establish the tracheal laceration. We found that MSCT could be performed without risk of desaturation, and also evaluated by different radiologist retrospectively after scanning. This procedure can be performed without discomfort in patients who are not intubated. Patients who should undergo MSCT imaging should not be under lethal or prolonged respiratory. These patients should also be hemodynamically stable enough for transfer to CT room. Urgent thora-cotomy may be preferable to MSCT imaging in case of progressive subcutaneous, deep cervical, and mediastinal emphysema.

We recommend non operative management if the following criteria are satisfied (stable vital signs in the patient; no difficulty ventilating the patient while intubated or respiratory distress while extubated; no evidence of oesophageal injury; minimal mediastinal fluid collection; no progressive pneumomediastinum or subcutaneous emphysema; no signs of sepsis (5).

We conclude that MSCT imaging can be a useful method for diagnosing the site and form of tracheal injury in hemodynamically stable patients. Conservative treatment has to be discussed when the tear involved in TBL is short, revealed by poor symptoms, and occurs after general anaesthesia. Care must be taken to choose a small-size tube during a short intubation of an obese female patient.

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ULOGA MULTISLAJSNE KOMPJUTERSKE TOMOGRAFIJE U HITNOJ DIJAGNOSTICI TRAHEOBRONHIJALNIH POVREDA NAKON ENDOTRAHEALNE INTUBACIJE – PRIKAZ BOLESNIKA

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Traheobronhijalne povrede (TBP) predstavljaju retke komplikacije koje nastaju nakon endotrahealne intubacije. Tretman može biti konzervativan, ukoliko je stanje bolesnika stabilno ili hirurški kod većih povreda sa razvojem pneumomediastinuma i/ili subkutanog emfizema koji ugrožavaju život. Totalna tireoidektomija bila je indikovana kod šezdesetogodišnje žene sa multinodularnom strumom. Deset sati nakon operacije došlo je do razvoja subkutanog emfizema na licu i vratu. Multislajsna kompjuterska tomografija (MSCT) vrata i grudnog koša potvrdila je postojanje subkutanog emfizema, pneumomediastinuma i rupturu zadnjeg zida traheje veličine 2 cm. Bolesnik je tretiran konzervativno. MSCT može biti korisna u dijagnostici lokalizacije i forme TBP kod hemodinamski stabilnih bolesnika. *Acta Medica Medianae* 2015; 54(1):53-55.

Ključne reči: multislajsna kompjuterska tomografija, endotrahealna intubacija, traheobronhijalne povrede