Les complications inattendues du traumatisme thoracique: rapport de cas

Introduction:
Les patients ayant subi un traumatisme thoracique ont habituellement un résultat sévère en raison de la suite d’événements et la complexité des lésions associées. Les principales lésions potentiellement mortelles doivent être découvertes lors de l’évaluation primaire du patient pour les soins immédiats.

Présentation du cas.
Un patient de sexe masculin âgé de 55 ans, s’est présenté au service d’urgence de l’hôpital départemental d’Urgence de la ville de Constanța le 18.12.2016. Le patient a été victime d’un accident de voiture, right seated passenger with seatbelt on. He was admitted in the ER with low blood pressure (blood pressure 80/55 mmHg) and dyspnea. After the car accident, nausea appeared, along with chest pain (posterior, interscapular-vertebral) and dizziness. No other symptoms were mentioned by the patient and no traumatic marks were identified. The mechanism of injury was by frontal impact with another vehicle. The past medical history included chronic peripheral artery disease, amputation of inferior 1/3 of right thigh, recurrent paroxysmal atrial fibrillation. Contrast chest and abdominal CT scan in A&E provided the etiology of shock: hepatic abscess in 2nd and 3rd liver’s segments, size 82 mm/75 mm/61 mm, extended to subphrenic space and transdiaphragmatic, to the anterior mediastinum, where it drained in the pericardium, causing acute pericardial effusion and cardiac tamponade.
Conclusion: This case is interesting due to major discrepancy between symptoms, clinical findings and the high severity of the acute pathology. Also the case is unique from another point of view: after history, clinical examination, blood tests and imaging tests, we were able to establish the diagnosis and to provide the emergency treatment but we could not identify the primary cause of liver abscess.

Keywords: trauma, NT-pro BNP, cardiac tamponade, hepatic abscess.

List of abbreviations:
CT – Computed Tomography
ER- Emergency Room
A&E – Accident & emergency department
ICU- Intensive care unit
GCS – Glasgow Coma Scale
Hb – Hemoglobin
SP O2 – O2 saturation
WBC – White Blood Cells
NT-pro BNP- N-terminal pro B-type natriuretic peptide
INR- International Normalised Ratio
ACS- Acute coronary syndrome
MI- Myocardial infarction
CBC- Complete blood count
CPR – cardiopulmonary resuscitation

INTRODUCTION

About 25% of fatalities caused by accidents are associated with thoracic trauma1,2 and treated by simple maneuvers, while only a few need thoracotomy2,3. Up to 60%–80% of patients who had stabbed wounds develop tamponade and the percentage is much lower in patients without penetrating thoracic trauma3,4. Top 6 rapidly lethal conditions required to be diagnosed at the first evaluation are: upper airways obstruction, tension pneumothorax and open pneumothorax, flail chest, cardiac tamponade, hypoxia and hypoventilation4. In order to obtain an objective evaluation, trauma scores are used, such as: A Severity Characterization of Trauma (ASCOT), Injury Severity Score (ISS), New Injury Severity Score (NISS), The Trauma Injury Severity Score (TRISS), and Revised Trauma Score (RTS). Another relevant aspect is the mechanism of injury, due to the fact that penetrating injuries have different pathophysiology and clinical evolution4,5. Nevertheless, it is important to mention that the serum values of NT-pro BNP might have a clinical significance in the case of cardiac impact, heart failure and sepsis6. Even under ideal conditions, clear signs of relevant thoracic injury may be subtle or even absent, often dealing with patients that due to traumatic event associated with untreated or undiagnosed underlying pathology develop life threatening conditions3,5.

Case presentation

We present the case of a 55-year-old man, victim of a car accident, right seated passenger with seatbelt on, who presented to the Emergency Department of Emergency County Hospital Constanta, Romania, on 18.12.2016.

The patient complained of shortness of breath over the last 10 days, in his opinion due to a “chest infection”. After the car accident, nausea appeared, along with chest pain (posterior, interscapulum-vertebral) and dizziness. No other symptoms were mentioned by patient. The mechanism of injury was by frontal impact with another vehicle.

Past medical history was represented by chronic peripheral artery disease, recurrent paroxysmal atrial fibrillation, amputation of the inferior 1/3 of right thigh. 10 days before, the patient described an episode of “chest infection”, untreated, with productive cough, dyspnea, without pyrexia. The current medication was Propafenone, Rosuvastatin, Acenocoumarol 2 mg/day (oral antivitamin K anticoagulant).
Physical examination revealed a conscious patient, with GCS 15, respiratory rate 18-22/min, SpO₂ 92-93% without oxygen and 100% with 6L of oxygen/min, heart rate 100/min, rhythmic, low blood pressure – 80/55 mm Hg; temperature 36.3 °C. The patient had been relatively stable, with mild to moderate shortness of breath, skin with normal colour, with sweating. At examination of the respiratory system, the patient had increased respiratory effort, vesicular murmur equal bilaterally, without rales, no wheezing. Cardiovascular system: normal heart sounds, systolic murmur, regular heart beats, normal ECG. The patient remained hypotensive, even after administering saline fluids (500 ml of sodium chloride 0.9%), without turgescence of jugular veins. The abdomen was soft, without tenderness, not distended, no pain on examination, bowel sounds present. Absence of gastrointestinal bleeding. No external lesions identified.

The therapeutical intervention was structured on 3 directions:
1. Emergency treatment and sustaining of the vital functions.
2. Blood and imaging tests.
3. Multidisciplinary examination in A&E.

These three directions of intervention have been followed simultaneously in A&E:
- GCS 15 points, RTS 7 points, ISS 6 points, ASCOT 3 points (2).
- Patient received oxygen 6 L/min, increased to 10 L/min via facial mask.
- Continuous monitoring of heart rate, blood pressure, respiratory rate, SpO₂.
- ECG: sinus rhythm 100/min, narrow QRS, without ST-T changes.
- Blood – collected for CBC, glycemia, creatinine, liver function tests, troponin, CK-MB, D-Dimer, NT-pro BNP, coagulation tests, including INR, inflammatory markers.
- Fast ultrasound examination was not available in the Emergency Department at that time, therefore emergency chest and abdominal contrast CT scan was solicited.
- The initial treatment was with 500 ml of sodium chloride 0.9% and 500 ml of Hartmann’s solution, plus metoclopramide 10 mg iv and ranitidine 50 mg. Another 1000 ml of sodium chloride 0.9% have been given in A&E in the next 4 hours, but BP remained low, within 75/50-90/55 mmHg.

The patient remained stationary, with low BP, despite fluid repletion in A&E. ECG, CK-MB and troponin ruled out an acute coronary syndrome. Complete blood count showed very high leukocytosis with neutrophilia. Liver function tests were within normal range, creatinine was increased, normal ions. D-Dimers were increased and a very high NT-pro BNP level was found, also with increased INR (Table 3). At this moment, another suspicion for shock etiology has been raised: septic shock/cardiogenic shock. Contrast thoracic and abdominal CT scan result indicated the etiology of shock: hepatic abscess in 2nd and 3rd liver’s segments, size 82 mm/75 mm/61 mm, extended to subphrenic space and transdiaphragmatic, to the anterior mediastinum, where it drained in the pericardium. (Figures 1, 2, 3, 4). In the pericardium, fluid was present with para-liquid density measuring 24 mm (purulent pericarditis). Antibiotic therapy with Meropenem was initiated.

**DISCUSSION**

Symptoms reported by the patient weren’t suggestive for the diagnosis. Increased leucocytes with neutrophilia oriented the diagnosis to an infection/septic status. Increased NT pro BNP, a biomarker of cardiac dysfunction, suggested a possible cardiac involvement.

This case is interesting due to major discrepancy between the symptoms, clinical findings and the high severity of the hidden pathology. Patient was hospitalized in ICU – general surgery clinic, and the case was managed by a complex team: cardiovascular surgeon, general surgeon, internist, and cardiologist. Liver biopsies were obtained for histopathological exam and microbiological cultures were done (Table 1, 2).

The technical surgical approach was: transverse supra-umbilical incision with transdiaphragmatic passage to the anterior mediastinum, with drainage of 300 ml creamy, smelly pus. The diaphragm and the pericardium were thickened. Pericardiotomy was performed, with drainage of approximately 500 ml liquid (fibrin purulent pus and blood); multiple cardio-pericardial adherences were found, which did not allow the exploration of the entire pericardial cavity. With the enlargement of the pericardial diaphragmatic broach, the liver abscess was identified (second and third hepatic segments), with subphrenic extension and transdiaphragmatic leakage to the pericardium, measuring 5/6 cm. The abscess was evacuated, biopsy samples were taken and lavage with hydrogen peroxide and dilute betadine has been made, and also double drainage of the peritoneal cavity. After the surgical intervention, treatment with Fluconazole and Metronidazole was started.

During the following 24 hours, the patient was constantly monitored and reassessed by cardiovascular surgeon, general surgeon, cardiologist and Intensive Care Consultant. Repeated blood cultures were negative (no bacteria revealed) (Table 3, 4, 5).
Anatomopathological report

Paraffin histopathologic examination

Macroscopic description
A tissue fragment, size 2.5 / 1.8 / 0.5 cm, with slightly irregular surface, hyperemic – hemorrhagic, elastic consistency

Microscopic description
Fragment of adipose connective tissue with large hemorrhagic areas. Vessels with incipient thrombi with areas of ischemic necrosis, focal liponecrosis, other areas with granulation tissue aspect and fibrosis. Also: xantogranulomatous nonspecific chronic inflammation along with numerous polymorphonuclear cells and few abscessed zones

<table>
<thead>
<tr>
<th>MICROORGANISM</th>
<th>Acinetobacter Baumanii</th>
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<tr>
<td>BIOLOGICAL PRODUCT CULTURE</td>
<td>Acinetobacter Baumanii (++++)</td>
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**ANTIBIGRAM**

**RESISTANT**
- Aztreonam ATM
- Ceftazidim CAZ
- Cefepime FEP
- Ciprofloxacin CIP

**SENSITIVE**
- Colistin CS
- Gentamicin GM
- Imipenem IPM
- Pefloxacin
- Piperacillin PIP
- Ticarcillin ICT
- Tobramycin TM
- Trimethoprim + Sulfamethoxazole SXT
- Piperacillin + Tazobactam TZP
- Meropenem MER

**RESISTANT**

**SENSITIVE**
- Minocycline MNO
- Rifampicin RA

*Figures 1, 2.* Contrast thoracic CT scan revealing pericardial effusion

*Figures 3, 4.* Abdominal emergency CT scan – hepatic abscess in 2nd and 3rd liver’s segments, dimensions: 82 mm/75 mm/61 mm
On 19.12.2016, the patient became suddenly hemodynamically unstable: with blood pressure 90/50 mmHg, associated with recurrent paroxystic atrial fibrillation 150-190/min. Emergency heart ultrasound showed a massive pericardial effusion – cardiac tamponade, requiring pericardiocentesis with pericardial drainage. His condition remained severe, with repeated peri-arrest arrhythmias (atrial fibrillation, atrial flutter, multifocal ventricular premature beats, ventricular tachycardia), pyrexia. Inotrope positive treatment was added and Vancomycin.

On 20.12.2016, the patient’s general status remained critical, despite proper treatment. Pericardial fluid decreased to 6-7 mm. Cardiac arrest occurred, unresponsive to advanced CPR measures.

The final diagnosis was: car accident victim with shock; cardiac tamponade secondary to a hepatic abscess fused in pericardium; chronic peripheral artery disease; recurrent paroxysmal atrial fibrillation (anticogulant treatment); amputation of inferior 1/3 of the right thigh.

**CONCLUSIONS**

- Due to severity of the pathologies and the need for simultaneously interventions, this case raised questions related to the best surgical approach and the best moment for abdominal and cardiac surgery.
- This case is interesting due to major discrepancy between the symptoms, clinical findings and high severity of the acute pathology and underlying disease.
- An accurate diagnosis couldn’t be possible without emergency contrast CT scan and biopsy results.
- Sometimes, an apparently minor or mild trauma may reveal a previous severe pathology, undiagnosed, that may evolve with acute life threatening conditions.
- Despite proper intervention in the ED department and ICU, chest injuries are responsible for 1-44% of deaths due to trauma in the USA, especially in young male patients.
- In the medical literature there is insufficient data about the relationship between thoracic trauma and elevated NT-proBNP levels.
• Our patient had a significantly increased value of NT-proBNP since the admission in the ER and also 24 hours later, that may indicate a more severe cardiac outcome.

• The proper management of a trauma patient involves multidisciplinary work of a medical and surgical team, in the attempt to save the patient’s life.\textsuperscript{13,14,15}

REFERENCES


