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Case Report

Asymptomatic Mediastinal Hematoma as a Complication of Ultrasound-Guided Internal Jugular Vein Catheterization

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ABSTRACT

Central venous catheterization is a frequently performed procedure in the intensive care units (ICU) for various treatments such as iv therapy, parenteral nutrition and hemodialysis but occasionally encountered complications can be fatal. Therefore, safe insertion with confirmation of correct positioning of the catheter is vital. Ultrasound (US)-guided insertion of catheters has been used widely, and its safety and efficacy have been demonstrated in several studies. However, this technique is not free from complications, such as carotid artery puncture, hemothorax, pneumothorax and infection. In this case, anterior mediastinal hematoma proceeded after US-guided internal jugular vein (IJV) catheterization.

Key Word: Mediastinal hematom, ultrasound, internal jugular vein catheterization

Ultrasonografi Rehberliğinde İnternal Juguler Ven Kateterizasyonu Sonucu Gelişen Asemptomatik Mediastinal Hematom

ÖZET

Santral venöz kateterizasyon yoğun bakım ünitelerinde (YBÜ) iv terapi, parenteral nutrisyon ve hemodializ gibi birçok tedavi için kullanılan sıklıkla uygulanan bir prosedürdür ancak bazen komplikasyonları fatal olabilmektedir. Bu nedenle, kateterin doğru pozisyonunun tespit edilip güvenli girişim yapılması hayatidir. Ultrasonografi (US) eşliğinde kateter girişi yaygın olarak uygulanmaktadır, ve güvenilirliği ve etkinliği birçok çalışmada gösterilmiştir. Buna rağmen, bu teknik karotid arter ponksiyonu, pnömotoraks ve enfeksiyon gibi komplikasyonlardan arınmış değildir. Bu olguda, US-eşliğinde yapılan internal juguler ven (İJV) kateterizasyonunu takiben anterior mediastinal hematom gelişmiştir.

***Anahtar kelimeler**: Mediastinal hematom, ultrasonografi, internal juguler ven kateterizasyonu*

INTRODUCTION

Central venous catheterization is a frequently performed procedure in the intensive care units (ICU) for various treatments such as iv therapy, parenteral nutrition and hemodialysis but occasionally encountered complications can be fatal. Therefore, safe insertion with confirmation of correct positioning of the catheter is vital. Ultrasound (US)-guided insertion of catheters has been used widely, and its safety and efficacy have been demonstrated in several studies. However, this technique is not free from complications, such as carotid artery puncture, hemothorax, pneumothorax and infection. In this case, anterior mediastinal hematoma proceeded after US-guided internal jugular vein (IJV) catheterization.

CASE

A 74-year-old woman was referred to Gazi University Emergency Department with the triad of symptoms of headaches, petechia and thrombocytopenia for management. A computarized tomography (CT) of brain examination revealed a combined epidural and subdural haematoma. She was managed conservatively with observation by the neurosurgical unit. She was admitted to haematology unit and treated with intravenous (IV) steroid and IV immunoglobulin for immune mediated thrombocytopenia. Subsequently she developed tonic-clonic epileptic seizures and required intubation and airway maintenance. She was admitted to ICU for management of low Glasgow coma scale and poor urine output. For the acute renal impairment, following the conservative therapy it was decided to proceed to initiate hemodialysis. She was given IV platelets replacement but there was no rise in the platelet count above 5000 units. Despite the

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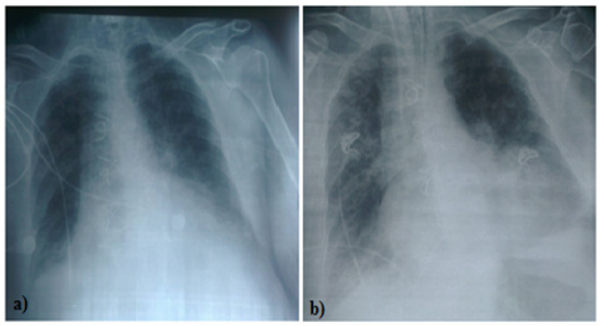

Figure 1. *Antero-posterior chest radigraphies of patient a) Before catheterization b) After catheterization*

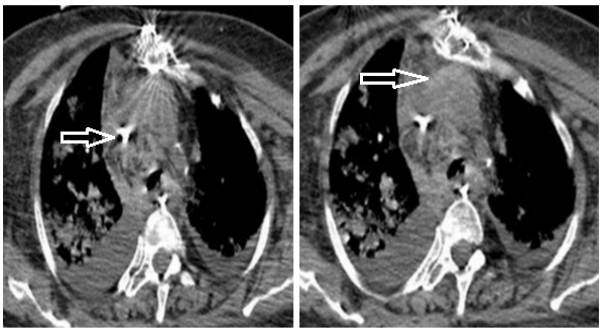

Figure 2. *Hematoma around the IJV catheter extending to the anterior mediastinum*

IV steroid, immunglobulin therapies and platelet replacement, still patients' platelet count was lower than $5x10^3$/UI. Therefore catheter had to be placed under low platelet count. The patient had the uneventful (first attempt) insertion of a double lumen hemodialysis catheter (12F, 16 cm) into the right IJV under real time US- guidance by the ICU physician. A post catheter chest X-ray was unremarkable with no mediastinal widening or gas (Figure 1). She was hemodynamically stable and not symptomatic for the next 24 hours. She had two episodes of hemodialysis in this period. The patient subsequently developed endotracheal hemorrhage and bilateral pulmonary infiltrates with a presumptive diagnosis of alveolar hemorrhage. A high resolution CT of the chest revealed hematoma surrounding the IJV catheter tract and the anterior mediastinum (Figure 2). This catheter was removed and a right sided femoral catheter was inserted.

DISCUSSION

Internal jugular vein is often the preferred vein catheterization for temporary hemodialysis in the ICU's, but some complications can be seen. Commonly reported complications include carotid artery puncture, arterial pseudoaneurysm, vascular injury, hemothorax, pneumothorax, thrombosis, stenosis, airway obstruction and infection (3). Ultrasound-guided catheterization has been reported to effectively decrease complications compared to conventional landmark technique (1,2). However, complications have been reported even when the procedure is guided by US. Mediastinal hematoma is an uncommon complication of central vein catheterization with only few cases reported. The hemotoma can develop in any location and structures within the mediastinum leading to differing presentations. The presentation may range from chest pain through to haemodynamic instability or sudden death (6). Chest CT examination is the most sensitive test to visualise localised hematoma and visualisation of the mediastinum. US guided IJV catheterisation may significantly reduce the rate of complications however it does not prevent them completely (4,5). This case demonstrates the development of a mediastinal hemotoma despite the use of US guidance without any evidence of clinical or hemodynamic signs.

This case suggests that using US does not completely guarantee a complication- free outcome of IJV catheterization and, that catheter placement should be carefully confirmed.

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