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## **Life threatening mediastinal haematoma: a complication of central venous catheterization**

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### **Abstract**

Central venous catheterization (CVC) has established risks and benefits in its application as a vascular access source, particularly in situations involving temporary cannulation. We present a rare case of life-threatening mediastinal haematoma resulting from CVC usage. Even though aggressive intervention yielded survival, the patient was left with permanent vocal compromise owing to traumatic palsy of the right recurrent laryngeal nerve. One should be careful in selection of venous access and be aware of alternatives routes.

### **Introduction**

Central venous catheterization (CVC) is employed globally with increasing frequency as a multipurpose tool. Though a useful source of temporary access for monitoring

and interventional purposes, it carries a variety of potential perils. We present a patient who suffered serious adverse effects of CVC usage, and recommend caution during interventional usage.

### **Case Report**

A 55 years old male underwent direct compression plating for a right tibial and fibular fracture acquired in a motor vehicle accident. Despite being a known case of chronic renal failure, he was maintained on intravenous antibiotics and analgesics during the post-operative period, including gentamicin and diclofenac respectively. Whilst the orthopaedic care was being weaned off, he developed an abrupt decline in urinary output amid a clinical picture suggestive of fluid overload along with raised blood urea nitrogen and creatinine levels. Ultrasound

guided renal biopsy indicated evidence of acute tubular necrosis. A diagnosis of oliguric intrinsic acute renal failure, presumably drug induced, was made. As a consequence of the ensuing uraemia, hemodialysis was initiated via intervallic catheterization of the right internal jugular vein.

During a subsequent cannulation for venous access with a Jo catheter, on the fourth day of hospital stay, the patient developed sudden respiratory distress with stridor and reduced bilateral air entry. Emergency chest roentgenography revealed a right paratracheal mass, confirmed by computed tomography to be causing significant tracheal compression. Immediate intubation and ventilatory support was initiated. Consequent neck exploration was undertaken which revealed a clot lying in the retrotracheal space, behind the carotid sheath; seen to be pushing the esophagus onto the trachea, and causing airway compromise by compressing the latter in the thoracic inlet. Clot drainage was carried out and haemostasis secured.

Mechanical support was thereafter gradually withdrawn in view of patient's ventilatory recovery. There was postprocedural unexplained hoarseness of voice, diagnosed later by fiberoptic laryngoscopy as being due to right vocal cord paralysis. The right cord was fixed in the paramedian position. No active intervention was felt necessary in this regard, owing to the left vocal cord being freely mobile and compensating across the midline.

The patient's subsequent hospital stay was uneventful and he stabilized from the acute nephrologic and respiratory compromise prior to discharge.

## Discussion

Acute renal failure is not an uncommon occurrence in hospital admissions. It is often a complication of a multitude of diseases and a major source of morbidity and mortality, owing typically to the serious underlying pathologies present amongst inpatients. Intrinsic renal failure, as in this case, has been associated with usage of both diclofenac and gentamicin.<sup>1,2</sup>

Haemodialysis is usually indicated in a clinical picture of uraemia. The choice for venous access is a subject of some controversy globally. Considerable variation exists in the usage of CVCs, arteriovenous fistulae and grafts, owing to alterations in local preferences and perceived patient variables. Consensus exists regarding the creation of arteriovenous fistula as a permanent venous access source, due to; their greater survival patency flow rates, ease of maintenance, lesser expense and complication rates. There is evidence to support usage of CVCs as a temporary source of vascular access, often necessitated in acute situations when other alternatives may be unavailable.<sup>3,4</sup>

CVCs are being increasingly used in modern tertiary care setup for indications such as; hemodynamic monitoring in unstable patients, chemotherapy in oncology ward, total parenteral nutrition and delivery of antibiotics, blood products and fluids. Even though trials establish the role of CVCs as a safe and efficient means in temporary haemodialysis<sup>4,5</sup>, the overall increment in CVC usage does tend to be somewhat worrisome. CVC utilization is associated with a number of potential complications such as infection, haematoma, catheter dislodgement or dysfunction, leakage, thrombophlebitis, arterial puncture, caval thrombosis and pneumothorax.<sup>6,7</sup>

Our case illustrates the potentially fatal nature of CVC usage. The case is unique and instructional in a multidisciplinary environment. An orthopaedic patient, already a known case of chronic renal compromise, went into acute renal failure owing to in-hospital pharmacotherapy using agents with established nephrotoxicity. Even though temporary venous cannulation may be justified, no attempt at native venous access had been sought in the past on this patient who was already on dialysis for chronic renal failure. Subsequent central catheterization led to life-threatening haematoma requiring aggressive surgical intervention and intensive care monitoring. Despite a favourable outcome, the patient was left with life long phonation compromise, presumably secondary to the traumatic complication of CVC.

Even though ultrasonic and electrocardiographic guidance may greatly facilitate central catheterization in modern facilities<sup>8,9</sup>, adequate knowledge of anatomy and health care staff experience remain important limiting factors universally.<sup>10</sup> Primarily placed as a 'suitable alternative', overzealous CVC usage may compromise the success of future permanent vascular access and generate suboptimal "dialysis delivery. One must avoid unnecessary vascular catheter insertions even for short-term use in chronically ill patients.

In conclusion our case affords a variety of lessons for the modern health care provider. One must use pharmacotherapy sensibly (especially in pre-morbid individuals), provide proper training of medical and nursing staff, and be cautious and judicious in the use of interventional techniques, keeping in view their potentially lethal complications.

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