

## An early tracheo-innominate fistula: Lessons learnt from a clinical encounter

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Madam, in a recent issue of the Journal of Pakistan Medical Association, Shah DA et al have described a patient with trachea-Innominate artery fistula (TIF).<sup>1</sup> Surgical repair of the fistula was complicated by re-bleeding. Patient's condition did not improve and ventilator support was withdrawn on the fifth post-operative day. The authors have cited that there is a higher incidence of TIF in patients with head injuries due to excessive hyper-extension of the neck; however, it is difficult to determine neck hyperextension in isolated head injuries. On the other hand, early haemorrhage in the post tracheostomy period is usually due to technical problems. Poor placement of the tracheostomy tube, trauma to large blood vessels and poor haemostasis may lead to early postoperative bleeding. When the tracheostomy is performed lower than the second to third tracheal ring, there is a high possibility of TIF formation due to pressure necrosis caused by the tip cuff or tracheostomy cannula.<sup>2</sup> It is true that orientation of brachiocephalic trunk is sometimes attributed to hyperextension of the head as it elevates the innominate artery and brings it against the tracheal wall at the level of tip or cuff of the tracheostomy tube, making the tracheal wall more vulnerable to ulceration.<sup>3</sup> This may be of particular significance in the case described, as the patient was in a state of coma and appropriate neck positioning is difficult to ascertain in similar patients.

As TIF associated mortality is up to 92.7%, which can be nearly 100% without surgical intervention, TIF related massive haemorrhage can be considered almost always fatal.<sup>4</sup> Hence the focus of management needs to be

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prevention of TIF formation and early detection of TIF related bleeding. Use of plastic tracheostomy tubes, low pressure-high volume cuffs, tube placement at second or third tracheal rings and flexed positioning of neck may prevent formation of TIF.<sup>4</sup> A 'sentinel' or 'herald bleed' is an early warning sign which is reported in more than 50% of patients who developed subsequent massive delayed haemorrhage.<sup>5</sup> A sentinel bleed renders the need of close monitoring and immediate medical attention.

Apparently, the main focus of the letter was surgical aspects of this rare complication; however, in setting of a neurological injury, there are certain other factors which need to be considered. Patients with brain injury may have respiratory depression and inability to protect their airways due to lower cranial nerve deficits. This predisposes the patients with tracheostomy to pulmonary complications especially if they are on mechanical ventilation. The chances of patients to suffer from asphyxia from their own blood are high in patients with TIF related haemorrhage. Since, delayed tracheostomy complications may take place in non-acute settings, more and more clinicians should be made aware of this life threatening complication.

### References

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