

**Case Report**

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# Managing Difficult Airway for Emergency Liver Transplant: More Than One Challenge to Manage

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**Received Date:** April 27, 2022**Published Date:** May 06, 2022**Introduction**

Results of orthotopic liver transplantation (OLT) are consistently improving. Patients who were not considered suitable for OLT earlier are now being taken up for this extensive surgery. It is uncertain whether to defer or proceed with this important emergency surgery with an extremely challenging airway. We report a case of a challenging airway, oral bleeding with coagulopathy presenting for emergency Orthotopic liver transplantation (OLT).

**Case Report**

A 62-year-old male was scheduled for emergency orthotopic liver transplantation because of end-stage liver cirrhosis due to hepatitis C and hepatocellular carcinoma around midnight. He had a history of remote tonsillar carcinoma requiring extensive surgical resection, including part of the tongue. He also had skin and arterial grafts from his left arm to the posterior pharynx for tissue defect reconstruction, followed by radiation therapy. He gave a history of bleeding inside the mouth from the raw surface of the skin graft. When he presented for OLT, he had signs and symptoms of portal hypertension, including significant ascites. He was malnourished because he could not eat and swallow solid food due to problems with deglutition and severe osteoradionecrosis. He was on a liquid diet for many years. On examination, his airway revealed a minimal mouth opening with an inter-incisor gap of 18 mm, Mallampatti class of 4, severely limited neck extension, and an old tracheostomy scar. His thyromental distance was also short, and his throat was expected to be woody. He also had muscle spasms around the jaw. Intra-orally, he had severe xerostomia. He had bleeding from the posterior pharynx and cheek.

The liver parameters were deranged, including total Bilirubin 19.2  $\mu\text{mol/L}$ , ALT 57 U/L, AST 151 U/L, and Albumin 31 g/L.

Coagulation profile was abnormal, including INR 1.4, PTT 33 s, fibrinogen 1.54 g/L, platelets count 47 and Hemoglobin of 120 g/L. His MELD score was 34, with a MELD sodium score of 35. We sought urgent ENT consultation for airway assessment and a possible awake tracheostomy. Time was the essence as the donor graft was marginal from a DCD. While waiting for the ENT, we empirically managed his coagulopathy by fresh frozen plasma transfusion. He received four units of FFP. After explaining the procedure to the patient, the ENT surgeon performed a quick nasal fiberoptic endoscopic examination of the airway. The larynx and the airway beyond it appeared fine. The only disrupted anatomy was within the posterior pharynx. It was decided to first attempt awake fiberoptic intubation with ENT standby, which was uneventful and atraumatic. OLT was successfully performed, the patient tolerated the procedure well, and there was no bleeding in the airway. OLT surgery was completed, and the patient was transferred to the ICU. Postoperatively, the patient kept bleeding from the mouth, and the ICU team was reluctant to extubate him. After two days, the ENT teams were consulted again, and it was decided to do a planned tracheotomy to avoid the risk of failed extubations and the difficulty of reintubation and bleeding in the mouth. Open tracheostomy was performed on day six post OLT. He was weaned off the ventilator, and the tracheostomy was closed after 15 days. His ICU stay was 25 days. Post OLT swallowing studies revealed severe oropharyngeal dysphagia. A percutaneous gastrostomy tube was placed for feeding. He was discharged 50 days after OLT, and the patient recovered well.

**Discussion**

Conducting anesthesia for OLT in patients with multiple comorbidities is not uncommon, and the anesthesiologists are

prepared for such challenges. Anesthesiologists are trained to manage patients with a difficult airway. However, the unique combination of factors in this case significantly added to the risk.

This patient presented with hepatocellular carcinoma and tonsillar carcinoma. He is already frail. He has had significant interventions for both cancers in his body. Chemotherapy affected this patient's immune system and caused other side effects, including nausea and vomiting. Radiation therapy can have local side effects on the patient body, especially on his face and oral cavity.

End-stage liver disease with an abnormal coagulation profile is another comorbidity that added a challenge to this case. This patient had an end-stage liver function with decompensation features including coagulopathy and bleeding tendency and the signs and symptoms of portal hypertension with massive ascites, which again added another challenge to managing the anesthesia for this patient.

This case was booked as an emergency surgery starting at midnight, which is an odd time when immediate help is limited. So quick clinical decision and immediate planning is essential.

The donor organ was a marginal liver graft. The donated liver came from a donor of cardiac death (DCD). This type of graft adds urgency to the procedure. On the other hand, we did not want to lose the donated liver, and at the same time, we wanted to save this patient's life.

More importantly, the anticipated difficult airway with the friable posterior pharynx, significant xerostomia, and active bleeding are risk factors. This patient had limited neck movement because of radiation-related fibrosis and a tiny mouth opening due to trismus. The latter has one more effect on overall oral hygiene. The graft area in his mouth was friable because of possible partial necrosis of the graft tissue. Xerostomia is also one of the complications of radiation therapy.

Surgery and radiotherapy for head & neck malignancy may produce anatomical alterations in the upper and lower airways, posing difficulty in airway management [1,2]. Awake fiberoptic intubation is the gold standard for managing difficult airways before surgery, but failures are reported in the literature in up to 13% of cases. [3,6-12].

Combining chemotherapy and radiotherapy with surgery is a standard management modality for patients with head and neck malignancy. The extent of airway anatomy changes varies among those patients. Local edema followed by fibrosis and tissue necrosis is a typical side effect of radiation therapy. Mucositis can be induced by radiation therapy and can lead to bleeding locally [4].

Osteoradionecrosis is one of the typical chronic complications of intense radiation therapy. Mandible bone is very vascular and very likely to undergo necrosis. The extent of this osteonecrosis is linearly related to the intensity and frequency of the radiation therapy [5]. There are no definite guidelines that guide decision-making on performing the tracheostomy in complex airway cases.

The prolonged period of irradiation may cause deformity of the larynx. Several case reports of failed fiberoptic intubation due to abnormal laryngeal shape or non-visualization of the airway canal [6]. Tracheostomy may be considered a better option in such challenging cases [7]. A quick check endoscopy by the ENT assured that the fiberoptic intubation was worth a try. We tried to correct the coagulopathy before instrumenting the airway and hoping that the bleeding inside the cheek and posterior pharynx would reduce/stop. We successfully performed awake fiberoptic intubation without causing any trauma to the airway. One could argue that the elective tracheostomy could have been performed preoperatively. However, we expected the mouth bleeding to stop after successful OLT and hoped that the conventional extubations was possible and tried to be less invasive. But the ICU team faced the same challenge and had to resort to tracheostomy.

## Conclusion

Managing multiple challenges involved with a significant surgery like liver transplantation is a big task. Indeed, a multidisciplinary team is needed, and all perspectives must be discussed. Clinical and endoscopic judgment and operator experience are the key factors for a successful outcome.

## Conflict of Interest

None.

## Acknowledgements

None.

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