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CLINICAL INFORMATION

Life-threatening airway obstruction due to upper airway edema and marked neck swelling after labor and delivery[☆]

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KEYWORDS

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Abstract

Background and objectives: Airway changes generally occur in normal gravidas; however, these changes could cause critical situations in specific populations.

Objectives: This article presents the case of a difficult airway patient that went into shock because of atonic bleeding after vaginal delivery for stillbirth.

Case report: A 32-yr-old woman with atonic bleeding after vaginal delivery for stillbirth was transferred to our hospital. She manifested shock, and her respiratory condition was progressively deteriorating. Airway obstruction caused by neck swelling and pharyngolaryngeal edema was apparent. We tried tracheal intubation using direct and indirect laryngoscopes. However, it turned out that insertion of the laryngoscopic devices to the oral cavity was impossible. After several attempts using the Trachlight™, successful intubation was finally made. After hysterectomy, she was admitted to the intensive care unit (ICU) and treated for five days. At discharge from the ICU, her Mallampati score was I-II. Her body weight decreased 60 kg to 51 kg during ICU stay.

Conclusions: We believe that concomitant attacks of labor and delivery and fluid resuscitation probably worsened upper airway and neck edema enough to cause acute airway obstruction and difficult laryngoscopy.

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Introduction

Studies have shown Mallampati score increase phenomena (assessment of the tongue size relative to the oral cavity) and oropharyngeal volume decrease during pregnancy, labor, and delivery.¹⁻⁵ Such airway changes generally occur in normal gravidas. Changes in Mallampati score or oropharyngeal volume alone has limited impact on airway management;^{6,7} however, airway changes arising from normal pregnancy could cause critical situations in specific populations. Here, we report a difficult airway case that went into shock because of atonic bleeding after vaginal delivery for stillbirth.

Case report

This case report is exempt from informed consent and institutional review board approval since it includes no ethical problem and the patient cannot be identified from case presentation alone, although patient's consent for publication had been obtained. A 32-yr-old woman with atonic bleeding after vaginal delivery for stillbirth at a private maternity hospital was transferred to our hospital. The cause of fetal death was suspected to be occult placental abruption. She probably manifested shock because of massive retroplacental hematoma during labor and delivery and had been given fluid resuscitation. When she was admitted to the maternal-fetal intensive-care unit (MFICU), her respiratory condition was progressively deteriorating. Airway obstruction caused by neck swelling and pharyngolaryngeal edema was apparent. A secure airway was needed. Assist ventilation using a bag-valve mask gradually became harder; thus, emergency invasive airway such as cricothyrotomy or tracheotomy was initially considered as the first option. However, there were a number of technical difficulties in establishing surgical airway due to neck swelling and bleeding tendency. We decided to attempt tracheal intubation using direct and indirect laryngoscopes. However, it turned out that insertion of the laryngoscopic devices such as the Macintosh-type, the McCoy-type, or the Pentax Airway Scope™ (AWS) to the oral cavity was impossible. After several attempts using the Trachlight™, a central, clear and bright transillumination suddenly became visible, which convinced us that it was just below the cricothyroid membrane and the Trachlight™ tip was going into the laryngeal inlet. Finally, successful intubation was made. After airway establishment, she was transferred to the operating room for emergency hysterectomy. To establish central venous cannulation via the internal jugular vein, ultrasound guidance was necessary because massive neck swelling made the conventional landmark method unusable.

The procedure lasted almost 2 h, with a blood loss of approximately 1,000 mL (blood loss before the procedure was unknown). The patient received 2,000 mL crystalloid, 1,000 mL hydroxyethyl starch 6%, 38 units of packed RBCs, 32 units of fresh frozen plasma, and 20 units of platelets until completion of the procedure from patient's admission. The patient was hemodynamically stable but still sedated under supported ventilation during the next two days in the ICU. Her trachea was extubated; however, further dete-

rioration of airway edema was no longer observed. At the discharge from the ICU after a five-day stay, her Mallampati score was I-II. Her body weight decreased from 60 kg to 51 kg during a 5-day ICU stay.

Discussion

Upper airway obstruction in this case was probably due to pharyngolaryngeal edema, which caused difficult ventilation as well as direct or indirect laryngoscopy. As mentioned before, airway changes, which mean upper airway edema, generally occur in normal pregnant women.¹⁻⁵ The underlying cause for this change is attributed to fluid retention that occurs with pregnancy.⁴ It is possible that the predominant factor responsible for aggravating airway edema especially during labor and delivery is straining and pushing, which is an integral part of labor and delivery.² However, most gravidas have no problem with their breath during pregnancy, labor, and delivery. Therefore, airway problems would not arise markedly without specific deteriorating factors. Previous reports have postulated the following as such factors: pregnancy-induced hypertension, fluid overload in conjunction with the antidiuretic properties of oxytocin, prolonged strenuous bearing down efforts, and subsequent surgery and fluid resuscitation.⁸⁻¹⁴ In this case, placental abruption followed by hemorrhagic shock and fluid resuscitation appeared to play a pivotal role in exacerbating airway edema during labor and delivery.¹⁵ Kodali et al. reported that fluid resuscitation against massive bleeding during elective cesarean hysterectomy caused a rapid change (Mallampati class 2 to 4 during surgery). They suspected that the susceptibility of gravidas for developing tissue edema as a result of intravenous infusion of fluids that produce a decrease in the colloid osmotic pressure may contribute to the prominent airway changes without labor and delivery. In our case, it is reasonable to consider that concomitant attacks of labor and delivery and fluid resuscitation worsened upper airway and neck edema enough to cause acute airway obstruction and difficult laryngoscopy.

In a case of difficult airway management, it is clear that a "can't ventilate" situation is more critical than a "can't intubate" one. The American Society of Anesthesiologists Task Force on Management of the Difficult Airway recommends establishing emergency invasive airway for the "can't ventilate" situation.¹⁶ However, our patient still breathed spontaneously. In addition, bleeding tendency during invasive procedure might have resulted in exacerbating the airway problem. Thus, we chose intubation, which had the possibility of enhancing laryngeal edema, for airway establishment with surgical airway readily available. Consequently, the Trachlight™ was only useful because the Macintosh, the McCoy laryngoscope, and the AWS were impossible to insert into the oral cavity. Successful use of the Trachlight™ has been reported in patients with a high Mallampati grade airway. Furthermore, we suggest that the Trachlight™ may be a useful option in the case of a difficult or impossible laryngoscopic intubation.¹⁷ The Trachlight™ is an appropriate device in this situation; otherwise, we may have been merely lucky.

In conclusion, a patient developed upper airway obstruction and difficult laryngoscopy during fluid resuscitation against atonic bleeding after vaginal delivery for stillbirth. Concomitant attacks of labor and delivery and fluid resuscitation probably worsened upper airway and neck edema enough to cause acute airway obstruction and difficult laryngoscopy.

Conflicts of interest

The authors declare no conflicts of interest.

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