

Case Report

Vomiting and aspiration during per-operative and post-operative period - A life threatening condition

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Abstract

Vomiting and aspiration usually occurs in those patients who are to be operated under general anesthesia in full stomach. It may occur in empty stomach also. It is an extreme emergency and needs urgent management. When it occurs, it worries an anesthetist as well as surgeon also. Immediate management should be started. As early as possible the patient should be turned in to lateral side with trendelenburg position. The pharynx and esophagus should be sucked as quickly as possible. All the resuscitator equipments should be ready at hand. Preoperative assessment and clinical examination is very important. Particularly history must be taken whether the patient had taken any food or not for the last six hours. Treatment should be adequate and prompt to avoid any disaster. If necessary the patient should be shifted to ICU for quick recovery. Here we present a case of 22 years old young man who developed vomiting and aspiration during tonsillectomy operation in North Bengal Medical College on 30th may, 2015.

Keywords: Aspiration Pneumonia, Bronchopneumonia, Tracheo-Bronchitis, Vomiting and aspiration.

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Introduction

The aspiration of stomach contents into the lung during induction, preoperatively or immediately postoperatively is a common cause of avoidable 'anesthetic' death. This may follow active vomiting in the presence of a depressed laryngeal protective mechanism, or in circumstances that overwhelm the normal mechanism¹. Passive regurgitation and aspiration is probably common in anesthetic practice, but in only a minority of instances does it cause clinical effects. Times of aspiration is usually before intubations, during induction, after extubation and in immediate post operative period^{2,3}. Dangers of vomiting during anesthesia are; Inhalation of stomach contents into the lungs with sequelae such as, pneumonia, bronchopneumonia, atelectasis and lung abscess. Hypoxia also occurs due to laryngeal spasm or obstruction. Prevention should be achieved by proper and adequate premedication with; esomeprazole, metoclopramide etc; which speeds gastric emptying³.

Case reports

Shafiqul Alam, aged-22 years of village and P/S-Ullahpara, Dist- Sirajgonj, was admitted in the ENT ward of North Bengal Medical College, with history of recurrent tonsillitis. He was prepared for "Tonsillectomy" operation. He was sent to anesthesia department for anesthetic fitness. All of his investigation reports were normal except the eosinophil count, that was 10. The anesthesiologist hesitated at first, then was agreed to administer general anesthesia. The patient was carefully examined once again and no history was revealed whether the patient had taken any food or not. No abnormality was detected from the investigations. And the anesthesiologist gave anesthetic fitness. The patient was then prepared in the ward, with antibiotic and crystalloid fluid for tonsillectomy operation. On the day of operation the patient was pre medicated with injection pethidine-75 mg and injection atropine intramuscularly. Then the patient was preoxygenated for 5 minutes.

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Induction of anesthesia was given with injection thiopentone- (5mg\per kg), and the patient was intubated by using injection suxamethonium- (1.5 mg per kg). Anesthesia was maintained with oxygen, nitrous oxide, halothane and injection vecurim- (.1 mg per kg). The operation was started immediately. Both the tonsils were removed by careful dissecting method. The tonsillar beds were stitched very carefully and the fine capillaries were cauterized. It took about 45 minutes to complete the operation. On completion of the procedure, the larynx, pharynx and esophagus were carefully examined. There was no signs of any bleeding. The patient was then reversed with injection neostigmine (2.5 mg) and injection atropine (1.2 mg). When the patient started to take spontaneous breathing the anesthesiologist satisfactorily extubated the patient. Post operated oxygen was continuing. All on sudden the anesthetist noticed that the patient suddenly developed cyanosis. Fluids were coming out from mouth and nostrils. The anesthetist quickly made laryngoscopy and found that whole mouth and pharynxes were filled with food particles. Mouth and nasopharynx were sucked immediately by sucker machine and the patient was reintubated. Crepitation and rhonchii was found in both lungs particularly in right lung. The anesthesiologist was confirmed that aspiration of vomits has occurred. The anesthesiologist started tracheo-broncheal toileting with normal saline. 100% oxygen was continuing by positive pressure ventilation. After a few minutes the oxygen saturation started to raise, and it became upto 95-96 percent. Massive dose of steroid (hydrocortisone) was administered. In the meantime the patient developed dangerous arrhythmia with hypotension. Blood pressure never raised above 80/50 mm of Hg. Without taking further risk the patient was shifted to Intensive therapy unit of Khwaja Yunus Ali Medical College Hospital. Where he was treated as "Aspiration Pnumonia", with antibiotic, bronchodilator, hydrocortisone and oxygen inhalation, etc. A few days later his general condition was very much improved and he was discharged from the hospital.

Discussion

In order to vomit, the patient must inspire and then close the glottis⁴. The lungs are thus filled with air which builds up intrathoracic pressure so as to maintain the diaphragm low in the abdomen. This acts as a roof against which the muscle of the abdomen contract to establish an intra-abdominal pressure which exceeds that in the thorax^{4,5}. This straightens the angle between

the stomach and the oesophagus, which normally functions as a sphincter, and allows forced evacuation of stomach contents into the pharynx. In the normal patient the glottis remain closed throughout this process and vomit is expelled from the mouth⁵. The stimulus to vomiting may come from the higher centres (visual, auditory, etc.) from the vestibular apparatus, and from a chemoreceptor trigger zone. Often in anesthesia it is the result of gastric distension and irritation or pharyngeal stimulation. Vagal stimulation may also cause nausea and vomiting^{6,7}. Vomiting is often preceded by such warning signs as swallowing and builds up to a full inspiration followed by closure of the glottis. It is commonly accompanied by signs of vagal activity, pallor, sweating and bradycardia^{5,6,7}. It is quite possible that minor degrees of tracheal soiling occur during vomiting and are usually without significance; this is especially likely in debilitated and elderly patients where the laryngeal reflex is depressed⁷.

If the inhalation is of an acid or irritant material, the inhalation of particular matter of sufficient size to block minor bronchi or the sheer volume of the aspirant that makes the condition serious. Blockage of the bronchi by particulate will cause immediate V/Q disturbance and if not removed will lead to pneumonitis, bronchopneumonia and lung abscess^{3,4}. Large volumes, even if they are clear fluids, can cause reflex bronchospasm, fluid absorption disturbances and problems associated with proteins, fat and other contained substances. The acid aspiration syndrome, as its name suggests, is caused by aspiration of acid⁵. It results in a chemical pneumonitis with many of the hallmarks of adult respiratory distress syndrome and carries a high mortality. It follows that for vomiting to occur there must be material in the stomach or in the distended small bowel, that the patient must be able to breathe in and close the glottis, he or she must have good abdominal muscle power and the glottic protective reflex must be obtunded^{4,5,6}. It is not possible to empty the stomach completely with any certainty. A large bore stomach tube can be used and will usually removed most of the fluid and smaller food matter. However, once removed, as is often recommended before anesthesia, the stomach may fill retrogradely from the small bowel when the intra-abdominal pressure rises⁶. Starvation alone does not empty the stomach; indeed, resting resting gastric juice is on average 150 ml and highly acid⁷. Even producing vomiting by use of an emetic such as apomorphine does not guarantee that the

stomach will not refill from the distended small bowel^{7,8}. What is surprising is not the aspiration of vomit occurs but that it does not occur more frequently. A once popular technique of dealing with patients at risk from aspiration of vomit was to make them breathe or to administer carbon dioxide before induction of anesthesia. The respiratory drive was then too active to allow the patients to hold their breath. As a result they could not vomit. However, if any expulsion of stomach contents occurred their laryngeal protection was absent. Depression with narcotics and hypnotics, local anesthesia and small doses of muscle relaxant are all more potent than volatile anesthetics to obtunding glottic reflex^{8,9}.

Methods of minimizing risks of aspiration

Reducing stomach contents, No solid or semisolid food should be taken within 6 hour of a planned operation. Fear, morphine, pain, pregnancy etc: delay gastric emptying, as may disease such as pyloric stenosis or bowel obstruction⁹. Stomach contents can be reduced in volume by aspiration through a wide-bore stomach tube. Metoclopramide may increase the rate of gastric emptying^{7,8,9}.

Reducing acidity of stomach contents

Antacids such as magnesium trisilicate and sodium citrate may be given 30-60 min before operation or sodium bicarbonate just before induction. H2-blockers such as cimetidine given intravenously increase the pH of gastric fluid and reduce the volume⁹.

Cricoid pressure

Correctly applied compression of the oesophagus between the cricoid cartilage and the vertebrae will obstruct the oesophagus. The pressure must be firm. Pressure should not be applied during active vomiting as there is a possibility of rupture oesophagus due to the pressure generated below the cricoid ring^{9,10}.

Use of head-down or lateral position

This used to be the treatment recommended, and still has much to commend it. It is difficult to aspirate vomit against gravity. A 15° head-down tilt does not make intubations difficult, whereas the lateral position does. If used properly it is very safe; the worst complication is that vomit will soil the nasopharynx and spill over the anesthetist. This position increases the risk of regurgitation following administration of a muscle relaxants¹¹.

None of the above technique is foolproof unless carried out with great care and attention to detail. A good working suction apparatus must be available and an assistant should be present during induction and intubation.

Conclusion

The vomiting and the aspiration of the stomach contents in to the lungs is very dangerous and a life threatening condition. Its life taking incidence is innumerable as it has caused so many anesthetic deaths. This situation should be handled very carefully and in cool brain. Although its main responsibility lies on the anesthesiologist, the surgeons can't deny their liabilities. They should carefully assess and select the patients for operation. History should be taken repeatedly whether the patient had taken any food or drinks within scheduled time. The first word in this situation is; "Don't Panic and Keep your Brain Cool."

Moreover it is the anesthetist as well as the surgeon, whose quick diagnosis and prompt management can save a patients life.

References

1. Scott-Brown, Micheal Gleeson, Otolaryngology, Head and Neck Surgery, Edition-7th, 2008, Vol-5, Page : 272-77. Publishers; Holder Arnold, UK.
2. Dhingra P L, Disease of E.N.T , Edition-4th, 2007, Post Tonsillectomy Complication, Page : 372-79, Publishers: ELSEVIER, India.
3. Sellick B.A, Jenkin J.C -Emergency Endotracheal Intubation, Queen's Marry Hospital Journal, 1998, Vol-5, Page : 103-4
4. Crawford S, and Potter S.R, - Aspiration of the stomach contents during General Anaesthesia, British Journal of Anaesthesia, 1997, Vol-7, Page : 353-55.
5. Paul W, Flinz, Brveely Haughs, Cummings, Otolaryngology, Head Neck Surgery, Edition- 5th, 2005, Page : 435-37.
6. Clayton D.G, and Evans P, Intensive Care Unit, American Journal of Medicine, Vol-19,1992, Page : 416,511-12.
7. Donegan J, Stephen E, Willium P Barness, Anaesthesia for Emergency otolaryngoioic Surgery, Manual of Emergency Suegery, Edition-1st, 1989, Page : 308-9.

8. Coben E.N, Mehta S, and Burton P. Accident, Complication and Sequelae of Anaesthesia, British Journal of Anesthesia, Vol-3, 2002, Page : 135-43.
9. Atkinson R S, Rushman G B and Alfred Lee J, A Synopsis of Anaesthesia, Edition 12th, Page : 341, 343-45.
10. Smith G, Aitkenhead A R, -Text Book of Anaesthesia, Edition-2nd, 1990, Complicatio during anaesthesia, Page : 405-19..
11. Stanley Feldman, Willium Harrop G and Nicholas H, Problems of Anaesthesia, 1996, Vomiting and aspiration, Page : 167-71.