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Non-cardiac surgery in a child after palliative surgical repair of tetralogy of Fallot

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Sir,

A child underwent a modified Blalock Tausig (left subclavian to pulmonary artery anastomosis) procedure at the age of 6 months for a tetralogy of Fallot. He was now 3 year old weighing 10 kilograms and awaiting a definitive surgical correction. He presented with a huge abscess on the right side of neck, was planned for incision and drainage under general anesthesia. The child had been doing reasonably well after the palliative surgery, he had picked up weight. Clinical examination was grossly apart from a soft continuous murmur in the right subclavicular area and the blood chemistry was within normal limits. Presence of any other co-existing anomaly was ruled out. He was premedicated with Syrup Midazolam 0.7 mg/kg given orally an hour prior to the surgery. He was brought in the operating room asleep under monitoring by the anesthetist. Anesthesia was induced with 3% sevoflurane and Fentanyl 30 mcg IV. Inj Cefotaxime 300 milligrams was given intravenously after a test dose. Anesthesia was maintained with 2% sevoflurane on spontaneous ventilation with face mask and modified Jackson-Rees circuit. His heart rate was 90-110/min and SpO_2 86-90%. Sevoflurane was switched off at the time of dressing of the wound and patient was woken up on oxygen:air mixture. Inj. paracetamol 200 mg was given at the same time. Once the child was completely awake he was shifted to the post-operative recovery room. After four hours he was discharged to the ward and he went home on the second post-operative day.

Tetralogy of Fallot occurs with a frequency of 3.6% in the normal population with an incidence of 1:3600 live births. The cause is unknown but there is an association with a chromosomal anomaly. The main clinical features are reduced pulmonary blood flow and cyanosis, and are variable in severity, depending on the degree of obstruction of the RVOT. After closure of PDA, decrease in pulmonary blood flow leads to deterioration in SpO_2. To prevent this deterioration in neonates PGE1 in the dose of 0.05-0.2 μg/kg/min is recommended to keep PDA patent to buy the time for surgical correction. Palliative surgery is done to divert systemic blood to lungs. Complete correction involves repair of VSD and widening pulmonic valvular area.

These patients tend to have lower body weight, poor vascular access after surgeries and lower pulse volume and pressures on the side of subclavian artery used for anastomosis.

The goal of the anesthetic management is to maintain intravascular volume and SVR, and low PVR. In general the room air saturation in non operated patients is around 70-80%, after palliative surgery 80-90% and after complete correction close to 100%. Hematocrit should be maintained between 35-45%, maintain cardiac output with or without inotropes e.g Dopamine, and keep oxygen consumption low by adequate sedation/anesthesia and muscle relaxation if necessary. The most important consideration or the concern is that of shunt blockage and the anesthetist managing the case should always be vigilant. The cardiac output should always be maintained. If an intravenous cannula is in situ anesthesia can be induced with ketamine 3-5 mg/kg along with glycopyrrolate

and midazolam. For inhalational induction and maintenance, Sevoflurane is preferred gas as it is sweet smelling, causes lesser myocardial depression than halothane and has minimal effect on SVR or PVR at MAC 1-1.5. Its important to keep in mind that $PaCO_2$- $EtCO_2$ difference is more (10-15mmHg) due to increased physiological dead space. Its mandatory to always be ready to tackle with hypercyanotic spell with 100% O_2, compression of abdominal and/or femoral arteries, phenylephrine 5-10 μg/kg or 2-5 μg/kg/min, morphine 0.05-0.1 mg/kg, bolus of IV fluids 15-30 ml, sodium bicarbonate 1-2 mEq/kg prophylactically if ABG facility is not there, esmolol 0.5 mg/kg followed by 50-300 μg/kg/min or propranolol 0.1 mg/kg and finally ECMO in refractory cases. These patients should be looked after well in the postoperative period and shifted only after being completely recovered.

REFERENCE

1. Lovell AT. Anaesthetic implications of grown-up congenital heart diseases. Br. J. Anaesth. (2004) 93 (1): 129-39. doi: 10.1093/bja/aeh172 [PubMed]

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The use of video laryngoscope (C-MAC®), a way to minimize the droplet transmission during intubation

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With the advent of C-MAC® video laryngoscope in the modern anesthesia practice, it is known to be useful in teaching skills required for intubation to the novice anesthetists. Similarly the technology has its role in managing the patients with difficult airway. We report its effectiveness in preventing the anesthetists form droplet infections. Recently we came across one patient who had invasive necrotizing lesion due to squamous cell carcinoma (biopsy proven after the surgery) involving his upper lip and nose with a purulent, foul smelling discharge and caused severe disruption of the facial anatomy (Figure 1).

Figure 1: Massive lesion involving the face

The patient needed to be intubated for wound debridement and biopsy. The functional assessment of the airway was done and it seemed to be slightly difficult one. There was a history of a recent uneventful general anesthesia. The real problem at that time was the foul smelling discharge from the wound which was unbearable even through the face mask. After the routine induction the bag ventilation was assessed. He was paralyzed and intubated successfully by using video laryngoscope. We think that the technique is not only useful to save the discomfort associated with foul smell of the wound but it may also prevent the intubating anesthetists from the spread of droplet infections like swine flu, viral hemorrhagic fever etc.

Prevention of air embolism during hysteroscopy

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Air embolism is a potentially catastrophic complication of operative hysteroscopy. Its incidence varies from 10-50% depending on the detection method used but prevalence of subclinical embolism may be as high as 100%.[1,2] We recently witnessed this complication in two patients and we briefly describe the preventive and therapeutic measures needed in such cases.

Twenty eight year old, ASA PS 1 female was scheduled for hysteroscopic guided Copper–T (Cu-T) removal. She underwent the same procedure previously, which was unsuccessful as only one limb of the Cu-T could be removed. Routine monitors were attached and anesthesia was induced with IV propofol and fentanyl followed by insertion of No. 3 Proseal™ laryngeal mask airway. Anesthesia was maintained with spontaneous breathing of oxygen (O_2), nitrous oxide (N_2O) and sevoflurane. The patient was placed in lithotomy position with 20□ Trendelenburg position. Hysteroscopy was performed using normal saline pressurized by pressure infuser on 3 lit non-collapsible bottle. Cu-T was firmly embedded in the myometrium and removed after vigorous extraction following which the patient developed pulseless electrical activity (PEA), with no recordable $EtCO_2$ and blood pressure. No heart sounds were heard but ECG showed sinus rhythm with heart rate of 90 bpm. Patient was immediately turned supine and administered 100% O_2 after trachea was intubated. Cardiopulmonary resuscitation was done for 45 min but patient could not be revived.

A thirty five year old, ASA PS 1 patient with history of infertility was posted for diagnostic hysteroscopy. Standard monitors were attached and anesthesia was induced with IV fentanyl, thiopentone and rocuronium. Trachea was intubated with cuffed 7.5 endotracheal tube and anesthesia was maintained with isoflurane/O_2/N_2O. Hysteroscopy was performed using normal saline through mechanical pump (EndoMet™). Patient was placed in lithotomy + slight Trendelenburg position. After 30 min there was a sudden fall in SpO_2, $EtCO_2$ and heart rate (100□40 bpm). Blood pressure was unrecordable. 100% O_2, atropine (0.6 mg) and adrenaline (1 mg) were administered. Patient was placed in Durant's position, right internal jugular vein was cannulated and 100 ml blood mixed with air was aspirated.

Box 1: Practice guidelines for perioperative management of patients scheduled for hysterolaparoscopy[3,4,5]

1. Hysteromat set and tubing should be free of air and changed with every patient. All sites of connections should be leak proof.
   a. Priming fluid should be free of air bubbles. One person should keep a watch on tubings and alert if air bubbles are noted.
   b. Intravenous set tubings should be prefilled with fluid.
   c. Mechanised pumps should be used for irrigating fluid.
   d. Y-connector should be attached on in flow line to allow for change of bottles without letting the air enter the system
2. Height of fluid bottles should be restricted to less than one meter above the patient.
3. Use of external pressure infusers should be avoided.
4. Pressure inside the uterine cavity to be kept <100 mm Hg during hysteroscopy.
5. Intra-abdominal pressure should be less than 10-12 mm Hg.
6. To avoid repeated insertions and removals of the hysteroscope.
7. Trivial injury of the uterus increases risk of embolism and thus the anesthesiologist to be informed and extra vigilance kept
8. Transthoracic echocardiography TTE/ Transesophageal echocardiography (TEE) probe to be used if available. TEE has the maximum sensitivity, they can also identify right to left shunting and even 0.5 ml of air bubbles can be detected.
9. Central venous catheters, arterial cannulas, resuscitation equipment and drugs to be kept ready
10. To avoid the use of N_2O and steep Trendelenburg position
11. Intravascular volume to be optimized.
12. Positive pressure ventilation.
13. Preoperative use of osmotic dilators (nonporous patients, prior cervical surgery)
14. Intracervical injection of dilute vasopressin helps in reducing the risk of embolism.
15. Dilatation and curretage to be performed after hysteroscopy

Dopamine infusion was started. Subsequently SpO_2 and $EtCO_2$ levels improved, blood pressure rose to 90/60 mmHg with pulse of 120 bpm. Patient was shifted to ICU; inotropes were gradually tapered over the next three hours. Trachea was extubated after 24 hours with no neurological deficit. Later surgeons admitted to have noticed several bubbles in the hysteroscope tubing which were not evacuated.

Prolonged surgical time and traumatic removal of the Cu-T leading to uterine perforation and opening of venous channels along with negative intrathoracic pressure during spontaneous breathing could have precipitated venous air embolism in the first patient. Use of external pressure infusers without Y connectors were the contributory factors. The volume of air embolism in the second patient was less and managed promptly by insertion of a central venous line and aspiration of air with patient in Durant's position. Y connector with mechanical pump was used in the second case but air bubbles had entered the tubing during change of fluids which was later on acknowledged by the OT technician and the surgeons.

Venous air embolism is preventable and every institute should issue practice guidelines for peri-operative management of patients undergoing hysterolaparoscopy (Table 1).

REFERENCES

1. Brandner P, Neis KJ, Ehmer C. The etiology, frequency, and prevention of gas embolism during CO2 hysteroscopy. J Am Assoc Gynecol Laparosc 1999; 6:421-8.[PubMed]
2. Leibowitz D, Benshalom N, Kaganov Y, Rott D, Hurwitz A, HamaniY. The incidence and haemodynamic significance of gas emboli during operative hysteroscopy: a prospective echocardiographic study. Eur J Echocardiogr 2010 Jun;11(5):429-31.[PubMed] [Free Full Text]
3. Imasogie N, Crago R, Leyland NA, Chung F. Probable gas embolism during operative hysteroscopy caused by products of combustion. Can J Anesth 2002;49(10):1044-7. [PubMed][Free Full Text]

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Helping the helpers: Incidence of drug use among healthcare professionals

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Sir

Drug addiction in Pakistan is one of the major causes for concern. It is not only prevalent in general population but also among individuals associated with medical profession; for example nurses, nurse anesthetists and anesthesiologists.[1] The prevalence of substance abuse in the nurse population is believed to be parallel to that in the general population (which is approximately 10%).[2] Current estimates place rates of substance misuse, abuse and dependence rates as high as 20% among practicing nurses. The American Nurses Association estimates that 10% to 20% of nurses have drug abuse problems and that 6% to 8% of registered nurses are debilitated due to their abuse of alcohol and other drugs. Nurses had the higher ratio of abusing benzodiazepines as compared to pharmacists.[3] A survey among health professionals reported frequency of substance abuse among anesthesia personnel to be 1.0% among faculty members and 1.6% among residents.[4] The most common drug abused by anesthesiologists is opioids such as fentanyl and sufentenil and ketamine.[4,5] Overall, health care professionals endorsed opioids twice as often as alcohol as a preferred substance. Family history of addiction, sex, and psychiatric problems are some other factors among healthcare professionals.[3]

A large number of empirical studies have been conducted in western countries. However, there is dearth of literature and there are hardly any empirical studies about the drug use in medical

and paramedical staff in Pakistan. Drug use may be associated with numerous health problems, such as, skin-related problems, abscesses and leg ulcers which eventually prompt to long-term health problems. The reasons for this use include the ease of drug availability, stressful environment,[1] curiosity, peer pressure and recreational use. The drug use persists due to craving. In a case study of an OR technician, he with four of his colleagues used heroin in injectable form. He revealed that Avil™, dexamethasone, Kinz™ (nalbuphine), Dormicum™ (midazolam), and ketamine, are more abused drugs among nurses and staff associated with operating rooms. He also shared that he would procure vials of ketamine from prescription of patients.

Early identification and control of the chemically dependent healthcare professionals is important for the safety of the public and for the well-being of the profession. The most frequently reported prevention strategy is wellness promotion education.[6] The role of paramedical staff is important in recognizing, reporting, and preventing substance abuse and the the anesthesia provider requires a high level of awareness and constant vigilance. Many territories and countries throughout the world now offer confidential, non-punitive assistance for nurses suffering from addictions.[7] Fear of punishment and disciplinary action may keep them from seeking help for themselves or from reporting a colleague or friend who is in need of help. Education is an important part of prevention, and medical and nursing school curricula ought to cover topics relating to substance abuse among the profession.

REFERENCES

1. Bryson EO, Silverstein JH. Addiction and substance abuse in anesthesiology. Anesthesiology. 2008; 109:905–17.[PubMed] [Free Full Text]
2. Griffith J.Substance abuse disorders in nurses. AORN J. 2005 Oct; 82(4):573-82. [PubMed]
3. Rojas JI, Jeon-Slaughter H, Brand M, Koos E. Substance abuse patterns and psychiatric symptomatology among three healthcare provider groups evaluated in an out-patient program for impaired healthcare professionals. Journal of addictive diseases. 2013; 32(1):99-107. Epub 2013/03/14.[PubMed] [Free Full Text]
4. Booth JV, Grossman D, Moore J, Lineberger C, Reynolds JD, Reves JG, et al. Substance abuse among physicians: A survey of academic anesthesiology programs. Anesth Analg. 2002; 95:1024–30. [PubMed] [Free Full Text]
5. Kintz P, Villain M, Dumestre V, Cirimele V. Evidence of addiction by anesthesiologists as documented by hair analysis. Forensic Sci Int. 2005; 153:81–4.[PubMed]
6. Bozimowski G, Groh C, Rouen P, Dosch M. The prevalence and patterns of substance abuse among nurse anesthesia students. AANA journal. 2014; 82(4):277-83. Epub 2014/08/30.[PubMed]
7. Monroe T, Kenaga H. Don't ask don't tell: substance abuse and addiction among nurses. Journal of clinical nursing. 2011; 20(3-4):504-9. Epub 2010/11/03. [PubMed]

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Uncommon case of an obstructed intravenous cannula

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New 'safety' cannulae have been introduced in practice which provide passive automatic protection against needle stick injury. They have a built-in mechanism which is activated upon removal of the needle from the cannula and covers the sharp needle tip. There have been no reports of structural defects in such cannulae causing problems. We report an instance where in spite of a successful intravenous placement with a safety cannula, it was unusable and had to be replaced.

An ASA I woman presented for an elective day case procedure. The patient had prominent and

so easy peripheral veins. A 20G venous cannula (Vasofix® Safety, B. Braun Melsungen AG, Germany) was inserted on first attempt. There was a flashback of blood into the hub. The cannulation was done as normal and the needle removed. It was then noticed that the cannula could not be flushed. There was no swelling at the site and the patient did not report any pain. The cannula could not be aspirated either. However, drops of blood did flow back on opening the end-cap. Repeat attempts at flushing the cannula failed. Another 20G cannula (same batch) was inserted into a different arm successfully on first attempt and the anesthesia proceeded uneventfully.

The first cannula was removed and inspected. There was no obvious physical damage, kink or change in its structure. When the cannula was flushed, the cause for the 'partial obstruction' became apparent. The tip of the cannula was blocked except for two narrow jets of the fluid being let out from the sides at different angles during the flush (Figure 1) with significant amount of pressure during injection. Since the cannula was not completely obstructed, it allowed the flashback of blood into the hub. One would expect that the presence of needle within the cannula would ensure cannula patency. This report shows that it need not be the case.

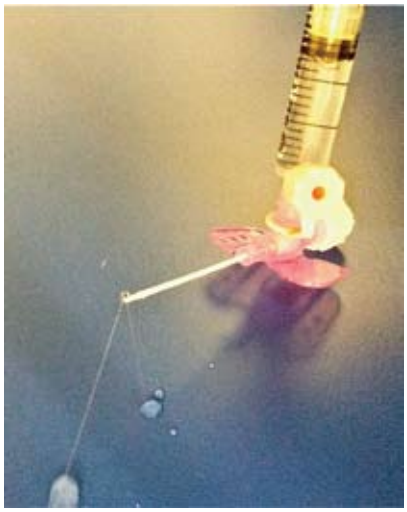

Figure 1: Tip of the cannula showing two thin jets of fluid

Structural defects in intravenous cannulae are very rare.[1,2]. The type of defect reported here can become significant in an emergency or in a patient with poor veins. Also, visible flashback of blood can lead to repeatedly failed attempts to flush the cannula as partial obstruction is less likely to be suspected. The old adage 'if in doubt, take it out' should be exercised.

REFERENCES

1. Sinden MP, Jayamaha JE. Defective intravenous cannulae. Anaesthesia 1995;50:829-830.
2. Bannister M, Stacey, MRW. Faulty intravenous cannulae. Anaesthesia 2000;55:937.

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