INDIAN ASSOCIATION OF PAEDIATRIC ANAESTHESIOLOGISTS

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Editorial

Enhanced Recovery after Surgery (ERAS) for children

Enhanced Recovery after Surgery (ERAS) is a multimodal, quality improvement, multidisciplinary approach to the care of surgical patients with the main aim of improving outcomes by modifying the endocrine and metabolic response to surgery rather than focusing solely on early discharge.[1] This concept was inspired by Dr. Henrik Kehlet and after adopting this protocol, many studies have demonstrated decreased hospital length of stay (LOS), complications and in-hospital costs in diverse adult surgical populations.[2]However, whether these ERAS principles can be applied to the paediatric population and whether similar benefits can be achieved in children is not clear. Since, children do not generally have prolonged recovery after major surgery due to minimal associated comorbidities and better physiology, the advantage of implementing the ERAS protocol in them for improving outcome is debatable.

There have been some studies, where the authors have used only few of the total of 20objectives of ERAS protocol to test their utility in children for achieving good outcomes in terms of hospital LOS and complications.[3-10]But there is a need to establish evidence that ERAS would be effective in children. Pearson et al in their scoping review identified 1269 patients in 9 studies where ERAS was utilized.[11] Out of these 9 studies, 3 were case control studies, 1 retrospective review and 5 prospective implementations. In these studies the interventional elements utilized were post-operative feeding, mobilisation protocols, morphine-sparing analgesia and reduced use of nasogastric tubes and urinary catheters. The outcomes tested included post-operative hospital LOS, time to oral feeding and stooling, complications, and parent satisfaction. Fast-track programmes significantly reduced LOS in 6/7 studies, time to oral feeding in 3/3 studies, and time to stooling in 2/3 studies. The authors concluded that use of ERAS in children was limited but may be beneficial in this population group.

ERAS protocols are based on evidence-based practices which minimize variation in delivery of perioperative care for a successful outcome. In the adult ERAS protocol there are 20 elements which need to be implemented together (Table 1).

The important elements in a paediatric ERAS protocol[12]should include the following:

Minimization of preoperative fasting and administration of a preoperative clear-fluid carbohydrate load: In adults, allowing carbohydrate rich clear fluid reduces insulin resistance, maintains glycogen reserves and minimizes protein breakdown. This concept is already an important part of paediatric preoperative preparation and improves comfort and reduces hunger and thirst. This is already a part of Nil Per Oral (NPO) guidelines of ASA and IAPA.

Avoiding preoperative hyperosmotic bowel preparation: Bowel preparation is done to reduce infections postoperatively. There is evidence to show that in adult colorectal resections isosmotic bowel preparation combined with oral or IV antibiotics minimizes the risk of infection and avoids electrolyte imbalance and fluid overload. However, in children the practice of bowel preparation is varied ranging from use of normal saline to peglec. Use of hyperosmotic mechanical bowel preparation leads to increased risk of surgical site infection (SSI), wall edema, bowel leak and anastomotic dehiscence. This aspect of ERAS protocol needs to be standardized and implemented in children for a better outcome as there is no standardized protocol for this.

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INSIDE THIS ISSUE

Multimodal, opioid-sparing analgesia: In ERAS protocol there is a major stress on providing non-opioid analgesia (paracetamol, non-steroidal anti-inflammatory analgesics (NSAIDs), gabapentinoids and regional analgesia) to minimize systemic side effects of opioids which are likely to delay recovery and aid in early mobilisation and oral intake. The use of regional anaesthesia aids in attenuating proinflammatory and endocrine stress responses and increasing gut motility. This aspect of care can be utilized in paediatric anaesthesia management.

Avoidance of nasogastric (NG) tubes: NG tubes are thought to help in decompressing the gastrointestinal (GE) tract and help in earlier return of bowel function. However, these tubes are uncomfortable and many studies have shown that patients without NG tube had earlier return of bowel function and decreased pulmonary complications. The patients also did not show increased risk of anastomotic leak. Therefore, avoiding NG tube in children is likely to be beneficial.

Early feeding: Most commonly, especially after GI surgery, oral feeds are withheld to allow healing of the anastomosis as well as to avoid PONV. However, a systematic review and a meta-analysis has shown that early feeding after GI surgery is unlikely to increase risk of anastomotic leak, wound infection and aspiration.[13]The concept of early feeding in GI surgery is still not popular in children and requires a change in the current mindset of surgeons.

Maintenance of euvolemia: This has been possible because of implementation of minimal fasting and avoiding mechanical bowel preparation. In adults, goal directed and restrictive fluid therapy has been found to improve postoperative outcome. This has not been extensively studied in children. The availability of non-invasive devices for calculating pulse variability index for monitoring fluid therapy intraoperatively has improved the maintenance of euvolemia. Studies examining fluid administration strategies are required in paediatric patients for administration of optimum volume of fluids perioperatively.

Adoption of minimally invasive surgical procedures also can improve the recovery in children. Many surgical procedures in children are now being done endoscopically and their adoption as a part of ERAS protocol needs more evidence.

There are few studies investigating ERAS protocol in children incorporating selective individual elements. [5,6] comprising ERAS. Also, few of the elements are already being used by the paediatric surgeons – minimizing preoperative fasting and early feeding. It is also possible that inclusion of all elements of ERAS may not be applicable or desirable in children. Short et al in their article tried to determine which individual ERAS elements are appropriate for inclusion in a paediatric-specific protocol through a modified Delphi process.[3]Based on this process all adult elements of ERAS were discussed for inclusion in the pediatric ERAS. Two adult ERAS elements were excluded from pediatric protocol – routine use of mechanical bowel preparation for elective colonic surgery and use of insulin to control severe hyperglycemia postoperatively. The authors then implemented this protocol they had made for pediatric colorectal surgery and compared it with the original management.[4]The authors developed a protocol to include preoperative, intraoperative and postoperative care elements. There was a decrease in median LOS and with no increase in complication rate in the ERAS group. They also had less IV fluids in the operating room, less narcotic use and were started on regular diet sooner.

Conclusion

The application of ERAS protocol is still in its infancy, however, it's implementation has the potential to improve the hospital LOS, minimize complications and readmission rate as well as improve outcome. Further studies are required to test the ERAS protocol in a wide variety of surgeries for its implementation in the surgical care of paediatric patients. It requires close co-ordination between the surgeon, anaesthetist, intensivist, PACU and surgical nurses. Research is ongoing to create an ERAS guideline that will reduce adverse events, enhance quality of care, increase parent satisfaction and improve the efficiency of neonatal surgical healthcare delivery.[5]

About IAPA

"The Indian Association of Paediatric Anaesthesiologists" was formed in March 2006

Total members – 582

IAPA has proposed 3 guidelines under guidance of Dr. Neerja

Table 1: Adult ERAS protocol

Preoperative
• Preadmission education
• Avoid prolonged fasting
• Carbohydrate loading
• Avoiding bowel preparation
• Prewarming
• Thromboprophylaxis
• Antibiotic prophylaxis
• Early discharge
Intraoperative
• Short-acting anaesthetics
• Neuraxial anaesthesia/analgesia
• Avoiding drains and tubes
• Minimizing opioids
• Activating warming
• Avoiding fluid overload
• Antiemetic prophylaxis
• Minimally invasive surgery
Postoperative
• Early removal of catheters, drains, tubes
• Neuraxial anaesthesia/analgesia
• Avoiding volume overload
• Minimizing opioids
• Antiemetic medication
• Early oral nutrition
• Early mobilization
• Strict discharge criteria

References

1. Ljungqvist O, Scott M, Fearon K. 'Enhanced Recovery After Surgery A Review. JAMA Surg 2017; 152: 292 – 8.
2. Kehlet H. Enhanced Recovery After Surgery (ERAS): good for now, but what about the future? Can J Anesth2015; 62:99–104.
3. Short HL, Taylor N, Piper K, Raval MV. Appropriateness of a pediatric-specific enhanced recovery protocol using a modified Delphi process and multidisciplinary expert panel. J Ped Surg 2018; 53: 592 – 8.
4. Short HL, Heiss KF, Burch K, Travers C, Edney J, Venable C, Raval MV. Implementation of an enhanced recovery protocol in pediatric colorectal surgery. J Ped Surg 2018; 53: 688 – 92.
5. Gibb CAN, Crosby MA, McDiarmid C, Urban D, Lam JYK, Wales PW. Creation of an Enhanced Recovery After Surgery (ERAS) Guideline for neonatal intestinal surgery patients: a knowledge synthesis and consensus generation approach and protocol study. BMJ Open 2018; 8: e023651.
6. Reismann M, von Kampen M, Laupichler B, Suempelmann R, Schmidt AI, Ure BM. Fast-track surgery in infants and children. J PediatrSurg 2007;42:234 – 38.
7. Vrecenak JD, Mattei P. Fast-track management is safe and effective after bowel resection in children with Crohn's disease. J PediatrSurg 2014; 49: 99 – 102.
8. Reismann M, Dingemann J, Wolters M et al. Fast-track concepts in routine pediatric surgery: a prospective study in 436 infants and children, Langenbecks Arch Surg 2009; 394: 529 – 33.
9. Matiolli G, Palomba L, Avanzini S et al. Fast-track surgery of the colon in children. J Laparoendosc Adv Surg Tech A 2009; 19 (suppl 1): S7 – 9.
10. Schukfen N, Reismann M, Ludwikowski B et al. Implementation of fast-track pediatric surgery in a German non-academic institution without previous fast-track experience. Eur J PediatrSurg 2014; 24: 419 – 25.
11. Pearson KL, Hall NJ. What is the role of enhanced recovery after surgery in children? A scoping review. PediatrSurgInt 2017; 33: 43 – 51.
12. Rove KO, Edney JC, Brockel MA. Enhanced recovery after surgery in children: Promising evidence-based multidisciplinary care. PediatrAnesth 2018; 28: 482 – 92.
13. Lewis SJ, Egger M, Sylvester PA, Thomas S. Early enteral feeding versus "nil by mouth" after gastrointestinal surgery: systematic review and meta-analysis of controlled trials. BMJ. 2001;323:773 – 76.

Good Read Articles:

Dr Y Chandrika, Bangalore

1. **Susan M. Goobie, Trudi Gallaghar et al. Society for the advancement of blood management administrative and clinical standards for PBM. Pediatric Anesthesia2019;29(3):231-236**
2. **Keira P Mason, Neena Seth. Future of pediatric sedation: towards a unified goal of improving practice. British Journal of Anaesthesia 2019;122(5):652-661**
3. **Marion Wiegele, Peter Marhofer, Per-Arne Lonnqvest. Caudal epidural blocks in paediatric patients: A review and practical considerations. British Journal of Anaesthesia 2019; 122(4):509-517.**
4. **Tariq Wani, Joseph D Tobias et al. Dura to spinal cord distance at different vertebral levels in children and its implications on epidural Analgesia. Pediatric Anesthesia 2018; 28:1-4.**
5. **Danial Rivera- Tocancipa, Elizabeth Diaz-Sanchez. How to ventilate the anesthetized child with the modern anesthesia machines? Rev Colomb Anesthesiol 2018;46(Supp):58-65.**

Answers to Pictorial Quiz:

Pic Q1: 1 -Placenta; 2- 80%; 3-126%; 4-67%; 5-52%; 6-31%; 7- 62%; 8-58%

Pic Q2: Schimmelbusch mask

Pic Q3: 1-Fetal hemoglobin; 2-Normal adult hemoglobin; 3-Myoglobin; 4-Carboxy hemoglobin

Pic Q4: Marraro double lumen tube

Pic Q5: Tracheo Esophageal fistula

Pic Q6: Patil's Masks- Difficult airways Can do mask ventilation and fibreoptic

it has an additional port with a soft silicone membrane to accommodate endotracheal tubes or different endoscopic devices. The port can be closed off with a plastic cap. The Patil-Syracuse mask is re-usable and can be autoclaved.

Pic Q7: 1-Placenta; 2-Ductus Vensosus; 3-Ductus Arteriosus; 4- Foramen Ovale

Pic Q8: Hudson Mask and 60%

Pic Q9: Mapleson F and 5 litres

Pic Q10: 1-ASIS; 2- Iliacus; 3-Peritoneum; 4 Transversus Abdominis Muscle ; 5-Ilio inguinal nerve ; 6- Ilio hypogastric nerve

PREVALENCE OF PAEDIATRIC REGIONAL ANAESTHESIA IN A TERTIARY SOUTH INDIAN CENTRE: AN OBSERVATIONAL STUDY

Dr. Suraj, Dr. Ekta Rai
Vellore

ABSTRACT-

Attainment of adequate level of analgesia during and after anaesthesia in paediatric patients is of paramount significance. Regional anesthesia in paediatric population is commonly practiced as an adjuvant to general anaesthesia all over the world. Practice and choice of paediatric analgesia has changed with increasing use of ultrasounds over blind landmark techniques. An observational study was undertaken to study the prevalence of the practice of paediatric regional anaesthesia at Christian Medical College, Vellore. The goals were to study prevalence and recent trends in choice of regional anaesthesia among children. During 3 months of study period, 1260 paediatric patients underwent elective surgeries. In 670 surgeries, regional analgesia was indicated and of which 364 patients (54.3%) received regional analgesia. Caudal blocks (44%), thoracic epidurals (16.2%) and lumbar epidurals (21%) were the major blocks performed. A rising trend of ultrasound guided TAP, paravertebral, qudratus lumborum blocks noted.

INTRODUCTION

Most of paediatric patients suffer from significant postoperative pain and every hour of effective analgesia counts, as it improves quality of care and reduces healthcare costs. Among hospitalized paediatric patients, the prevalence of moderate to severe postoperative pain that extends well into the postoperative period remains high. To provide patients with a level of analgesia that meets their needs, a multimodal approach is used that includes regional analgesia. Pain management should aim to reduce children's pain to an acceptable pain level without compromising their degree of mobilization.

Regional analgesia comprises both central and peripheral techniques. Single shot caudal block are very often performed. Although neuraxial blocks produce excellent pain control and are commonly used for paediatric pain relief, they carry a risk of serious complications such as paraplegia that can be more prevalent than is often realized. By contrast, peripheral nerve blocks which have become more prevalent with the increasing popularity of ultrasound – produce effective pain relief and have a low risk of morbidity. Trunk blocks such as paravertebral, transverses abdominis plane (TAP), rectus sheath and ilioinguinal / iliohypogastric are becoming a preferred method of analgesia for thoracic and abdominal procedures and should be used instead of central nerve blocks whenever possible.

Given the diminutive structures of paediatric patients and the close proximity of many vital structures, the use of ultrasound is recommended. The ability to visualize pleura, bone structures, relevant musculature and fascial layers with ultrasound offers many advantages over the conventional landmark-based fascial 'pops' technique that is more subjective. Ultrasound improves the accuracy, efficacy and safety of regional anaesthesia and also decreases the amount of local anaesthetic injected.

Laparoscopic surgical techniques are minimally invasive but can be associated with unexpectedly high levels of postoperative pain. The visceral and gas pain can be as severe as the incisional pain. To counter the pain following laparoscopic surgeries, a multimodal approach that includes peripheral nerve blocks and/or incisional local administration at the surgical instrument site could form the crux of an effective analgesic regimen.

Advantages of paediatric regional anaesthesia are as follows-

1. Analgesia is superior than with other modes of analgesia, result in calmer patient and parents/caregivers.
2. Reduced need of general anaesthetics and intravenous opioids result in early recovery and discharge from PACU.
3. Reduced risk of respiratory depression associated with intravenous opioids.
4. Early weaning from post-operative ventilation with adequate pain control.
5. Obtunds hormonal stress response, offers hemodynamic stability.
6. Improved gastrointestinal function, preserved peristalsis and splanchnic perfusion.
7. Reduced hospital stay and expenses.

METHODOLOGY-

In our study all the patients of paediatric age group undergoing elective surgery at Christian Medical College, Vellore during study period of 3 months were observed. Informed consent obtained from caregivers/parents. Demographic data was collected which included patient's age, surgery undergoing, type of regional analgesia received, placement of catheter, and duration of analgesia offered.

Inclusion criteria- All patients from newborn to 18 years of age undergoing elective surgery were included.

Exclusion criteria- Patients undergoing Neurosurgery, Cardiothoracic surgery, MRI under anaesthesia and cardiology laboratory procedures were excluded.

RESULT & DISCUSSION-

Study period was of 3 months from 27th June 2017 to 26th September 2017. During this time total of 1260 paediatric patients underwent elective surgeries. Patients were grouped into 2 categories depending upon the need of regional anaesthesia for the surgery. All surgical procedures where regional anaesthesia was not feasible were separated from surgical procedures requiring regional anaesthesia.

Out of 1260, 670 patients underwent surgeries where regional anaesthesia was indicated(Table1).

Out of 670, 364 patients received regional anaesthesia accounting to 54.3%. Table 2 describes the types fo blocks performed in our

In 79(21.7%) patients, catheters were inserted & received post-operative analgesia for 2-3 days. Adequate sensory block was achieved with continuous infusion of 0.1% Ropivacaine with 1mcg/cc Fentanyl. Top up boluses were given as per need. Post operative pain assessment was done by pain team.

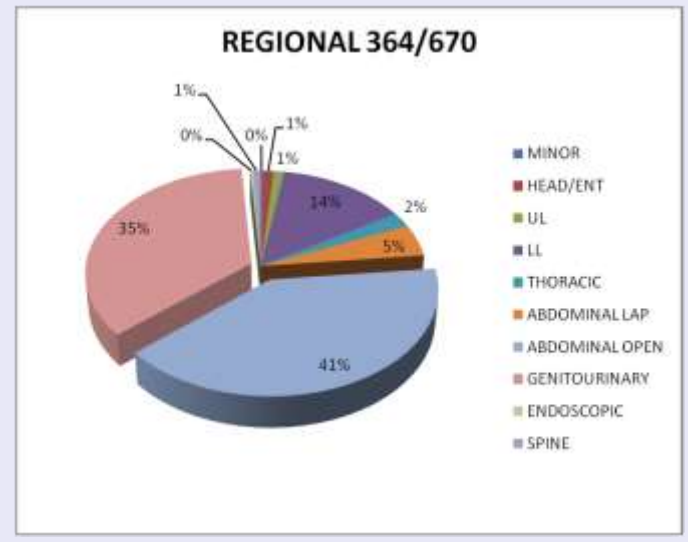
Table 1- Table demonstrating the total number of regional blocks administered in 3 months

TOTAL	1260
PROCEDURES REQUIRING REGIONAL	670
REGIONAL BLOCKS GIVEN	364

Table 2 –Table enumerating the regional blocks administered

REGIONAL TYPE	OUT OF 364	PERCENTAGE
THORACIC EPIDURAL	59	16.2
LUMBAR EPIDURAL	77	21.1
CAUDAL BLOCK	160	43.9
PARAVERTEBRAL	20	5.5
CERVICAL PLEXUS	3	0.8
BRACHIAL PLEXUS	3	0.8
PENILE BLOCK	13	3.6
FEMORAL	0	0
POPLITEAL	0	0
ANKLE	0	0
ERECTOR	2	0.6
TAP	8	2.2
SAB	9	2.5
QUADRATUS LUM	4	1.1
ILIOINGUINAL	5	1.4
FASCIA ILIACA	1	0.3

Fig1 -Type of surgeries performed during 3 months



Present study results were compared to Pediatric Regional Anaesthesia Network (PRAN)[1] multi-institutional study conducted in United States, published in IARS journal. In this study conducted 2010,total 14719 blocks were performed, with single injection blocks & continuous catheter blocks combined together. Caudal blocks were 45%, thoracic epidurals 4.7%, lumbar epidurals 10%, sub-arachnoid blocks 0.5%, upper extremity blocks 3.2%, lower extremity blocks 19%, Head & neck blocks 3%. Other blocks including ilioinguinal, intercostal, rectus sheath, penile, paravertebral & TAP blocks were 12%

This showed dependence on neuroaxial & landmark techniques requiring no imaging being prevalent in our institute. In lower extremity surgeries, lumbar neuroaxial blocks were preferred over ultrasound guided peripheral nerve blocks. Other blocks including paravertebral blocks, erector spinae, penile, ilioingiunal blocks were comparable with PRAN study.

BLOCKS	PRAN	PRESENT STUDY
Caudal	6741(45.1%)	160(43.9%)
Thoracic Epidural	708(4.7%)	59(16.2%)
Lumbar Epidural	1621(10.8%)	77(21.1%)
SAB	83(0.5%)	9(2.4%)
Upper Extremity	481(3.2%)	3(0.8%)
Lower Extremity	2851(19.1%)	0(0%)
Head & Neck blocks	556(3.7%)	3(0.8%)
Others	1873(12.5%)	53(14.5%)
Total	14,719	364

CONCLUSION-

All paediatric age group patients who received any type of regional anaesthesia were comfortable during post-operative period, required minimal or no parenteral opioid analgesics. They were ambulated earlier on the 1st-2nd post-operative day. The pain assessment in paediatric patients is difficult. Every hour of effective analgesia counts, as it improves quality of care and reduces healthcare costs. If a patient is not a candidate for regional anaesthesia, local infiltration analgesia should be considered to reduce side-effects from opioid use.The ultrasound guided peripheral nerve blocks are more preferable over central blocks for lesser risk of neuronal damage, requiring lesser local anaesthetic drug and thus lesser chances of toxicity. Limitations were availability and accessibility to ultrasounds in operating rooms, higher learning curve, and difficulty in identifying structures in presence of edema, obesity and higher cost. Caudal blocks remain the main mode of regional anaesthesia (44%) in younger children. Thoracic (16%) and Lumbar (21%) epidurals remain the main choice with limited accessibility to ultrasounds. Paravertebral, transverse abdominis plane, quadratus lumborum, fascia iliaca, ilioinguinal blocks are on increasing trend, which may replace blind thoracic and lumbar epidurals in recent future.

Reference

1. Polaner DM, Taenzer AH, Walker BJ, Bosenberg A, Krane EJ, Suresh S et al. Pediatric Regional Anesthesia Network (PRAN): a multi-institutional study of the use and incidence of complications of pediatric regional anesthesia. Anesth Analg. 2012 Dec;115 (6):1353-64

Emergency bedside laparotomy for a Preterm ELBW Neonate in the Neonatal Intensive Care Unit

Dr. Gita Nath, Dr. Samir Inayath
Hyderabad

INTRODUCTION:

With the advancement in intensive care, an increasing number of preterm neonates with multiple comorbidities are being managed in the neonatal intensive care units (NICU). These neonates require a host of supports on multiple issues including mechanical ventilation and inotropes and often require surgery for multiple issues. Transporting these children from the NICU to the operating room poses a risk and increases the complications. Here we report a case where emergency laparotomy was carried out for a 25-week preterm neonate (corrected age of 29 weeks) with extremely low birth weight (ELBW) of 640 grams.

Case report

A 25-weekgestational age premature neonate, was delivered in a tertiary maternity center by emergency Caesarean section for premature rupture of membranes. At birth, the baby had delayed cry and required resuscitation. As the neonate developed respiratory distress, was intubated and ventilator support was initiated. Following initial management, the child was referred to a higher paediatric center formanagement.

The baby wasadmitted in the NICU (level III) and mechanical ventilation and dopamine inotrope support were initiated. A cardiac evaluation revealed cardiac anomalies, a patent ductus arteriosus (PDA) and atrial septal defect (ASD) with left to right shunting. A total of three doses of surfactant were administered to facilitate resolution of respiratory distress.

At 4 weeks of age (post conception 29 weeks, weight 640 gm), the baby developed abdominal distention and dark loose stools. With a provisional diagnosis of necrotizing enterocolitis an emergency laparotomy was planned.Pre anaesthetic evaluation was done, appropriate investigations and blood products were arranged. Keeping the fragile nature of the baby in mind and risks of transportation to the operating room involved, the decision was taken by the team to conduct the surgery in the NICU.The team included two anesthesiologists, pediatric surgeon, neonatal intensivist and trained support staff for each.

On the day of surgery, the child was maintaining vitals on minimal dopamine support (5µg/kg/hr) and requiredsynchronized intermittent mandatory ventilation (SIMV) with anFiO2 of 0.25, inspiratory pressures of 18 cm H2Oand respiratory rate of 50/minute, maintaining an oxygen saturation of 85-95%. The child was shifted to the isolation roomin the NICU. Monitoringincluded non-invasive blood pressure, electrocardiography, pulse oximetry and temperature. Disposable, sterile drapes, radiantwarmer, LED operating light, suction and appropriate surgical instruments were shifted from the operating room.

Anaesthesia was induced with 1 mg propofol, 1 µg fentanyland 0.6 mg rocuroniumand maintained by total intravenous anesthesia, intermittent boluses of propofol 0.1 mgand fentanyl 0.1µg. Mechanical ventilator settings were changed to continuous mandatory ventilation mode and FiO2of 0.4. Dextrose containing Ringer's lactate was infused at 10 mL/kg/hr, and pre-operative and postoperative blood sugars were noted. The total operative duration was 40 minutes during which brief episodes of hypotension were treated with fluid boluses and increase in inotrope support.The residual neuromuscular blockadewas not reversed and mechanical ventilation was continued. Arterial blood gas and oxygen saturation were used to optimizeventilator settings. The baby was handed over to the NICU team for continued care.

At the time of the submission of this report the child was still being cared for in the NICU, inotropes were weaned off and improvement in respiratory parameters noted.

24 – 30	**Severe premature**	**<1000**	**Extreme low birth weight**

However, there were no indications for further surgery.

Discussion

India has the highest number or preterm deliveries in the world with over 3.5 million every year.1,2 Improvements in neonatal care have significantly improved the outcomes among prematureneonates. However, these neonates can present with a number of complications requiring surgery at any point in their recovery. Novel approaches are the need of the hour to facilitate recovery with minimizing adverse outcomes.

The degree of prematurity is classified based on gestational age and birth weight (Table 1).3

Table 1 - Relation Between Gestational Age and Birth Weight3

GESTATIONAL AGE (Weeks)		BIRTH WEIGHT (g)	
36 – 37	Borderline term	<2500	Low birth weight
31 – 36	Moderate premature	<1500	Very low birth weight
24 – 30	Severe premature	<1000	Extreme low birth weight

Depending on the institute layout, the operating rooms are often at a distance from the NICU. Providing anesthesia outside the operating room has always been a challenge to anesthesiologists and warrants more caution and preparation when high-risk children are being operated upon. Transport of children from the ICU entails a variety of risks such as temperature and hemodynamic fluctuations, managing endotracheal tube position and care for vital lines and monitors.Thejourney back from the operating room can be even more hazardous as children are often most fragile immediately after surgery. Any minor alteration can prove disastrous and it is compounded by the need to tackle these situations while en route.

Currently babies can be safely operated in a level III NICU environment which for care for the mostsick babies. These centers are equipped to manage prematureand ELBW babies requiring prolonged mechanical ventilation, sustained life support and can also support surgical intervention.4 Many reports of surgeries done at the bedside in theNICU setting include gastrostomy, PDA ligation, tracheostomy, repair of trachea-esophageal fistula, laparotomies, repair of abdominal wall defects, stoma closure, post-hemorrhagic hydrocephalus surgery and several urinary interventions (Table 2).5-10

***Table 2* - System Wise Indication for Bedside Surgery in NICU[5]**

Neurosurgery	Hemorrhagic hydrocephalus in VLBW, LBW neonates, VSG shunt placement, Reservoir placement.
Thoracic Surgery	TEF, CDH, CLE, Enteric cysts, Tracheostomy
Cardiac Surgery	PDA ligation
Abdominal Surgery	Laparotomy for NEC, Perforation, Obstructions, Abdominal wall defects, Stoma creation
Genitourinary Tract Surgery	Nephro-, Pyelo-, Uretero-, Vesico-stomies, Hydrometrocolpos drainage

***Table 3* – Recommended Infrastructure for Surgery in the NICU[5]**

Instruments for surgery	Paediatric surgeon, Anesthetist and Neonatologist
Radiant warmer / incubator	OT and NICU support staff
LED Light	Isolation / procedure room
Sterile disposable drapes	Inhalational agents / anaesthetic drugs
Central oxygen and suction supply	Laparotomy / Thoracotomy sets
Ventilator	Electrocautery and accessories
Multi para monitor with temperature probe	

Although there are no specific recommendations, level III NICUs should provide the whole range of medical neonatal care but not necessarily all specialist services such as neonatal surgery.4 The infrastructure and equipment required may not always be available especially in low-cost settings. Suggestionsfor equipment and personnel are mentioned in Table 3.

References

1. https://www.who.int/news-room/fact-sheets/detail/preterm-birth
2. https://www.nhp.gov.in/disease/reproductive-system/female-gynaecological-diseases-/preterm-birth
3. Quinn JA, Munoz FM, Gonik B, Frau L, CutlandC, Mallett-MooreT.Brighton Collaboration Preterm Birth Working Group. Preterm birth: Case definition & guidelines for data collection, analysis, and presentation of immunization safety data. Vaccine. 2016; 34(49): 6047–6056.
4. Levels of Neonatal Care Committee on Fetus and Newborn. Pediatrics. 2012; 130 (3): 587-597.
5. Sinha SK, Neogi S. Bedside neonatal intensive care unit surgery-myth or reality! J Neonatal Surg. 2013;2(2):20.
6. Frawley G, Bayley G, Chondros P. Laparotomy for necrotizing enterocolitis: intensive care nursery compared with operating theatre. J Paediatr Child Health. 1999; 35:291–5.
7. Klotz DA, HengererAS. Safety of pediatric bedside tracheostomy in the intensive care unit. Arch Otolaryngol Head Neck Surg. 2001;127:950-5.
8. Noble HG, Driessnack M. Bedside peritoneal drainage in very low birth weight infants. Am J Surg. 2001;181:416-9.
9. Lago P, Meneghinil L, Chiandetti L, Tormena F, Metrangolo S, Gamba P. Congenital diaphragmatic hernia: intensive care unit or operating room? Am J Perinatology. 2005; 22:189-97.
10. Arbell D, Gross E, Preminger A, Naveh Y, Udassin R, Gur I. Bedside laparotomy in the extremely low birth weight baby: a plea to bring the surgeon to the baby. Isr Med Assoc J. 2007; 9:851-2.

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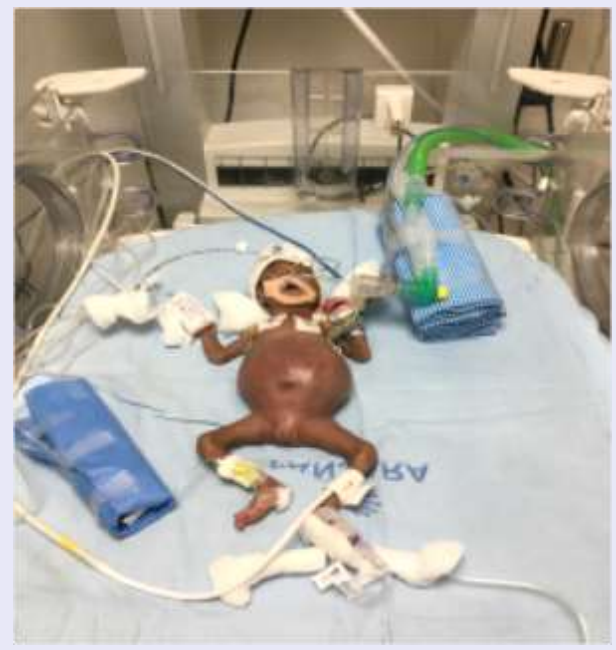
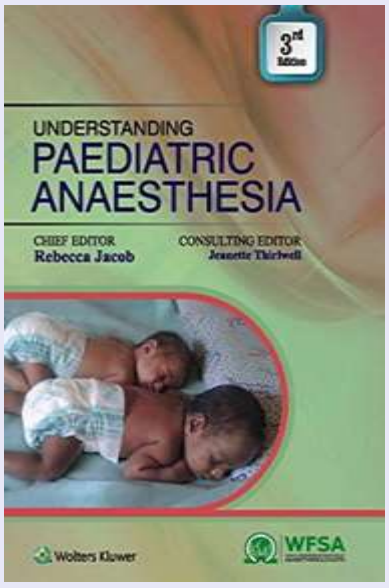
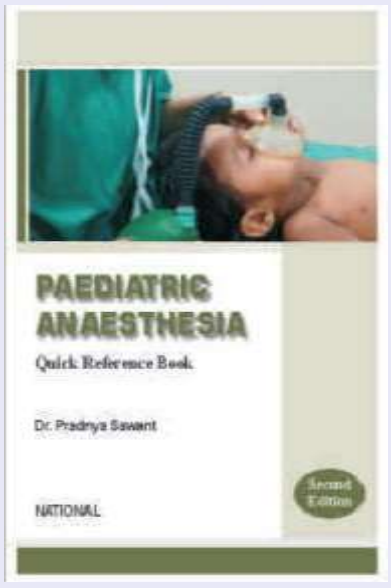


Achievements Section

This section has been dedicated to appreciate all our seniors and colleagues who have been inspirational to all of us .



Dr. Rebecca Jacob, former President of the IAPA, is a Member of the Medical Advisory Council of Smile Train India. She has also done us proud on the International front as a past Chair of the Paediatric Committee of the WFSA and is currently President of ASPA (Asian Society of Paediatric Anaesthesiologists)
She has authored “Understanding Pediatric Anesthesia’ which has been translated into numerous languages and into its 3rd edition



Dr Pradnya Sawant authored the 3rd edition of Pediatric Anesthesia Quick Reference Book.7000 copies of this book have already been sold.We congratulate her achievementsand success.

“IAPA Newsletter allows you to advertise your paediatric fellowships , vacancies related to paediatric anaesthesia.

Contact –Editorial Team for more information

Anaesthesia for Bronchoscopy in Neonates and Infants

Dr. Aavula Muralidhar,
Hyderabad,

Introduction

Bronchoscopy in neonates and infants under anesthesia requires special equipment and a sound knowledge of anatomy, physiology and pathology of the pediatric airway. These determine the key differences in management between paediatric and adult bronchoscopy. The procedure should be performed in a tertiary referral center.To ensure that adequate oxygenation is maintained via the shared airway, there must be excellent communication between the anaesthesiologist and the endoscopist. The infants' tongue is large, epiglottis is longer, narrower and angled more posteriorly when compared with an adult, their larynx is softer, higher and more easily displaced, tidal volume is low and fixed and therefore minute ventilation can be increased only by an increase in respiratory rate. Functional residual capacity (FRC) is less than the closing capacity, therefore predisposing to atelectasis and they are obligatory nasal breathers. Above all, high metabolic requirements in neonates predispose them to hypoxia.

Indications

Diagnostic:

Airway obstruction e.g.,tracheomalacia
Persistent/recurrent pneumonia
Tracheoesophageal fistula (TEF)
Transbronchial biopsy for histology
Failure to wean from ventilator
Haemoptysis

Therapeutic:

Removal of foreign body
Suctioning of mucus plugs *e.g.,* cystic fibrosis
Facilitate endobroncheal intubation for one-lung anaesthesia
Laser therapy
Balloon dilation of trachea/bronchus
Stent insertion

Fig 1. Flexible bronchoscope

Bronchoscopes

*Rigid bronchoscopes*are of the ventilating and venturi type. An appropriate size rigid bronchoscope allows a leak at 20-25cmH_2O. Air trapping is a potential hazard when controlled ventilation is used. Occurrence of bradycardia is invariably secondary to hypoxia until proved otherwise. Rigid bronchoscopy is favoured for immediate preoperative location of tumors and surgical assessment and is the method of choice for extraction of foreign bodies and the procedure requires general anaesthesia.

Venturi Bronchoscopes are open-ended metal tubes. Gas exchange is by jet insufflation of the lungs with oxygen and entrained air using a Sanders injector. Maintenance of anaesthesia has to be intravenous anaesthetic agents as an inhalational agent cannot be delivered, nor is it possible to monitor gas delivery. Carbon dioxide retention and the risk of barotrauma are complications and this technique is unsuitable for infants.

Flexible bronchoscopes consist of bundles of fibreoptic fibers with a magnifying lens system at the distal end. The tip of the bronchoscope can be angulated 160° up and 90° down using a steering wheel at its proximal end. The smallest bronchoscope available is ED 1.8mm distally and 2.2 mm proximally (Olympus BF N20). Infant sizes do not have suction and injection ports. Spontaneous ventilation occurs around the instrument, hence it will be difficult for the patient to breathe if the scope size is too big. It can be introduced nasally or orally, commonly under local anaesthesia with sedation. The smaller diameter makes a steerable access to the distal airway possible. The field vision is greater with a fibreoptic bronchoscope than with a rigid one, this facilitates examination of the upper lobe and apical divisions of the lower lobe bronchi. Used mainly for diagnosis and as an aid to intubation in the child with a difficult airway. The Laryngeal Mask Airway (LMA) provides a safe route for anaesthesia, oxygenation and the insertion of flexible bronchoscope while providing anesthesia with sevoflurane along with oxygen and maintaining spontaneous ventilation. The fibreoptic bronchoscope is passed through the LMA via an angle piece with a sealed port. The internal diameter (ID) of the LMA allows the passage of a larger bronchoscope than if one had to pass it through an endotracheal tube. A disadvantage of LMA is that it can cause the vocal cords to appear immobile. The fibreoptic bronchoscope can penetrate to the subsegmental bronchi and is now used routinely for all diagnostic procedures under local anaesthesia and sedation.

Contraindications include a sick moribund infant, severe and advanced cardiac failure,untreated congenital myasthenia gravis,lesions of the cervical spine where hyperextension of head might lead to compression of spinal cord*e.g.,* Down's syndrome.

Preanesthetic considerations

Preoperative assessment

Previous anaesthetic history and review of previous records to know if any difficulty faced during intubation, endotracheal tube size used etc. Enquire about stridor, respiratory distress and cyanosis in relation to position, crying and feeding. Inspiratory stridor suggests extrathoracic obstruction, expiratory stridor occurs with intrathoracic obstruction.

Specific investigations include: Chest x-ray to localize an inhaled foreign body or a CT Scan to evaluate a possible cause for obstruction.

Preparation and premedication

A variety of appropriate endotracheal tube sizes, supraglottic airway devices, laryngoscopes and bronchoscopes should be available. Monitoring should include electrocardiogram, noninvasive blood pressure and pulse oximeter, end-tidal carbon dioxide and temperature. Intravenous access should be secured prior to induction, but if the child is distressed this can be performed immediately after induction. A written high-risk consent should be obtained.

Anxiolytics such as midazolam 0.5mg.kg^{-1} orally, may be given with caution in an older infant. Anticholinergic agents have a dual effect of preventing bradycardia secondary to airway instrumentation, and an anti-sialagogue effect. Dexamethasone 0.6mg.kg^{-1}IV can minimize airway oedema following instrumentation. Lignocaine spray may be administered via the bronchoscope (within the maximum dose limit). Fentanyl 1-2 µg.kg^{-1}can be administered with caution. A nasogastric tube should be introduced to deflate the stomach as and when necessary.

General anaesthesia techniques

The decision one has to make is should one provide general anaesthesia along with a muscle relaxant or maintain spontaneous ventilation.The indication for bronchoscopy usually dictates both the method of anaesthesia and the type of bronchoscope used.

Requirements for Bronchoscopy

To provide anaesthesia, analgesia, sufficient relaxation, abolition of reflexes from respiratory tract, maintenance of adequate gas exchange, rapid recovery of –consciousness, respiratory drive and cough reflex.

For induction and maintenance sevoflurane is the best choice and is comparatively well tolerated in high concentrations. A rapid induction is possible without coughing, laryngospasm and apnoea or haemodynamic instability. Total intravenous anesthesia (TIVA) can be used to maintain anaesthesia as well. Propofol with or without opioid is a technique of choice and provides good airway reflex suppression, rapid emergence and far less air pollution and can be used in newborns as well.

Medications used during the procedure include: Lidocaine (1-2%) solution in a dose of 1-2mg. kg^{-1} used either on the vocal cords or carina to minimize cough and bronchospasm.Hypertonic saline, acetylcysteine and/or recombinant human deoxyribonuclease (dornase-alfa) is used in collapsed lung lobes to re-channelize airways. Albuterol inhaler and IV dexamethasone is used during prolonged intervention to minimize bronchoconstriction. Adrenaline soaked pledgets can be used for a patient with haemorrhagic airway. Broncho alveolar lavage **(**BAL)isperformed to determine the microbe when respiratory infection is suspected. So also, in conditions of haemosiderosis, lipoid pneumonia, alveolar proteinosis and in cases of unclear diagnosis.For localized lesions, BAL can be performed only in the affected lobe.BAL is performed with introducing warmed normal saline (body temperature) in a dose of 3 mL.kg^{-1} in three divided doses in children less than 20 kg. to a maximum of 20 mL injected at a time. Approximately 40 – 70% of fluid is recovered by suction.

Complications

Particularly with rigid bronchoscope, trauma to the lips, teeth, base of the tongue, epiglottis and larynx (commonly by an inexperienced endoscopist). Damage to the tracheobronchial tree results in pneumothorax, pneumomediastinum and surgical emphysema. Whatever method of anaesthesia is used there is an ever-present danger of desaturation and hypoxaemia, despite the presence of the side port through which oxygen can be administered. The laryngoscope may need to be withdrawn repeatedly. Excessive suctioning removes gases including oxygen and cause atelectasis. Bronchospasm can be secondary to irritation of the trachea-bronchial tree. Hypercarbia can occur due to air trapping. Bradycardia occurs secondary to hypoxia or airway instrumentation. During recovery stridor may occur secondary to subglottic oedema. In this situation, nebulised adrenalin 1:1000 in a dose of 0.5 mL.kg^{-1}, produces transient relief. IV dexamethasone for stridor, produces more sustained relief. Reintubation may be required. There may be considerable bleeding following biopsy.

Post-operative recovery

It is safer to have a crying infant who can cough. Always position in thelateral position. Nebulization with bronchodilators and / or steroids may be required in the postoperative period. Vital signs need to be monitored regularly and experienced personnel readily available.

The following cases are an example of situations:

Case 1: A 1-month-old, 2.35kg female neonate presented with severe respiratory distress, SpO_2 in room air was78%, with O_2 support maintained at 95%. The initial possibility suspected was mucous plugs in the trachea and right upper bronchus. The X-ray chest / CT scan showed consolidation of right upper lobe. The baby was scheduled for diagnostic and therapeutic bronchoscopy.

Case2: A 3 day old, 2.45 kg male neonate presented with severe respiratory distress, SpO_2 in room air was less than 50%, the baby was intubated and ventilated and with $FiO_2$of 0.5, maintained his SpO_2at 95%. With a suspicion of mucous plugs laryngomalacia or tracheomalacia was scheduled for diagnostic /therapeutic bronchoscopy. The following pictures depict perioperative anaesthestic management.

Fig 2.LMA connected to paediatric circuit maintaining spontaneous respiration can be used to facilitate fibreoptic bronchoscopy. With an LMA, hypoxia is avoided as oxygen is continuously administered during bronchoscopy.

Fig. 3 & 4: Flexible bronchoscope passed through the LMA. With an appropriate size, it can be easily introduced, oxygen administered and facilitates visualization of glottic and sub glottic structures and to diagnose laryngomalacia.

Fig. 5: Treating bronchospasm with a nebulizer connected to angle piece of the circuit connected to LMA. It also easy to give 100% O2 with CPAP.

Fig. 6: Chest X–ray PA view showing right upper lobe atelectasis before bronchoscopy

Fig. 7: After bronchoscopy, right upper lobe improved after bronchoscopy

Conclusion

Advantages of using LMA for neonatal bronchoscopy compared with mask ventilation and / or ventilating bronchoscope are mainly the ease to tackle complications like hypoxia, laryngospasm and bronchospasm (connect the nebulizer directly to Ayer's T piece circuit angle piece) and in addition drugs and saline can be instilled into the trachea.

Further Reading

1.Roberts S. ,Thornington R. E .Continuing Education in Anaesthesia.Paediatric bronchoscopy.Critical Care & Pain,Volume 5(2) 2005

2.Nussbaum E, ZagnoevM Paediatricfibreoptic bronchoscopy with a laryngeal mask.. Chest 2001; 120: 341–2

3. Yazbeck-Karam VG, Aouad MT, Baraka AS.Laryngeal mask airway for ventilation during diagnostic and interventional fibreoptic bronchoscopy in children..Paediatr. Anaesth2003; 13: 691–4

4. Remington S, MeakinG .Nebulised adrenaline 1:1000 in the treatment of croup. Anaesthesia1986; 41: 923–6

5. Swanson KL, Prakesh UBS, Midthun DE, et al.Flexiblebronchoscopic management of airway foreign bodies in children. Chest 2002; 121: 1695–700

6. Rayan S. Terkawi ,Khaild A. Altirkawi, Abdullah S. Terkawi et al,Flexible bronchoscopy in children: Utility and complications.. International Journal of Pediatrics and Adolescent Medicine (2016) 3, 18e27,

7.Malherbe S, Whyte S, Singh P, Amari E, King A, Ansermino M.J.Total intravenous anesthesia and spontaneous respiration for airway endoscopy in children: a prospective evaluation. Paediatr.Anaesth.2010;20:434

Anaesthetic Challenges for Mediastinal Mass Surgery in Children: Case Series

Dr. Shilpa Agarwal, Dr. Geeta Kamal, Dr. Aikta Gupta, Dr. Bhumika Kalra

Delhi

INTRODUCTION

Anaesthesia for patients with mediastinal masses can be challenging. The complications rate related to airway obstruction with the use of general anaesthesia in patients with mediastinal masses is around 7-18%[1]. Under general anesthesia, there is high-risk of cardiovascular and airway collapse leading to life-threatening airway obstruction, especially in children. So a cautious approach is necessary before subjecting them to anaesthesia.[2]We report the management of two pediatric cases with mediastinal mass undergoing thoracotomy.

Case 1

A 35 day old male child, weighing 2kg (birth weight 2.9kg), diagnosed case of mediastinal mass, was posted for thoracotomy. The child was admitted in high dependency unit with acute onset respiratory distress, respiratory rate 55/min, SpO_2 60% on room air and 90% with oxygen hood and was started on bronchodilators and antibiotics. The patient had history of recurrent chest infections and weight loss since day three of life. On preoperative evaluation, SpO_2 was 97% on room air, air entry was markedly reduced on left side and normal heart sounds. There were no features of mass effect. Hemoglobin was 7.9gm%, TLC elevated (21000/mm^3). Chest X-ray PA view [Fig1],showed left lung opacity with mediastinal shift to right. CECT chest suggested great vessel anomaly leading to mass effect and dextrocardia, left lung collapse with right middle and lower zone atelectasis. Parents were counseled regarding general anesthesia and informed high risk consent and assent was obtained. A left thoracotomy was planned on semi-emergency basis with availability of blood and bed ventilator in ICU.

Preoperatively standard monitoring including electrocardiogram(ECG), non-invasive blood pressure(NIBP), end-tidal CO_2 , pulse oximetry, temperature instituted inside the operation theatre. After induction with sevoflurane and confirming ability to ventilate, intravenous thiopentone 10 mg and fentanyl 4µg was given followed by muscle relaxation with atracurium 1 mg and trachea was intubated using 3.5 mm cuffed endotracheal tube(ETT). An extra 24G iv canula secured after induction of anesthesia. Epidural catheter inserted in T_{11}-T_{12} intercostal space with 19 G Tuohy Needle and 20 G catheter for perioperative analgesia. Infant was carefully positioned in right lateral position protecting eyes and pressure points. Anaesthesia was maintained with O_2, sevoflurane and atracurium. 100ml of frank pus was drained from loculated empyema. During surgery, patient developed hypotension, started on dopamine infusion and so epidural analgesia withheld, analgesia was supplemented with iv paracetamol. Chest closed after placing an intercostal chest drain (ICD). At the end of the surgery, neuromuscular blockade reversed with neostigmine and glycopyrrolate once signs of spontaneous respiration present, but trachea not extubated due to signs of inadequate respiratory efforts and shifted to pediatric intensive care unit for elective ventilation. The patient was gradually weaned off inotropes and ventilatoron day 2 postoperatively, and discharged after 1 week. Postoperatively analgesia was maintained with iv paracetamol Epidural catheter removed on day 2 postoperatively. Epidural analgesia avoided since patient was hemodynamically unstable.

As bronchial blockers are not available in our hospital and surgeons don't prefer one lung ventilation so one lung ventilation was not planned in our case management.

Fig 1

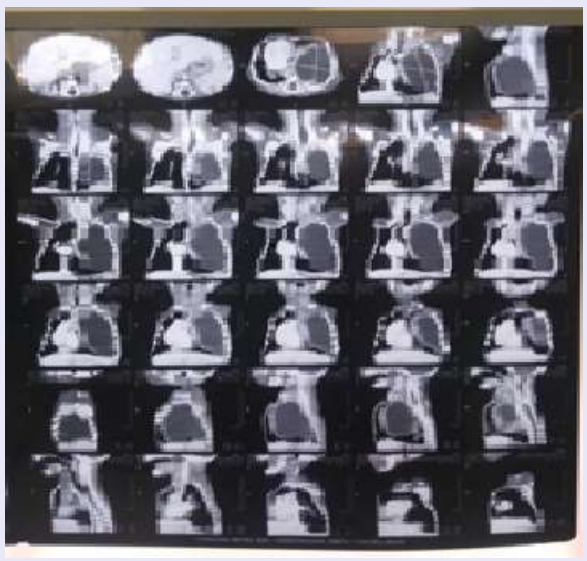


Fig 2

Case 2

A 2year male child, weighing 10 kg, diagnosed as a case of anterior mediastinal mass, posted for thoracotomy. His primary complaints were recurrent chest infections, fever and weight loss. On examination, patient settled, SpO_2 was 97% on room air. Air entry was markedly reduced in right upper chest with normal heart sounds, with no features of airway or cardiovascular involvement. Hemoglobin 10.2 gm%, TLC elevated(25000/mm^3). Rest all investigations unremarkable. CXR PAview showed opacification near hilum. CECT chest showed mediastinal mass of 36 by 39 mm, mass effect on adjacent hemithorax. The mass was cystic with foci of calcifications suggesting teratoma. Parents counseled regarding general anesthesia and informed high risk consent and assent was obtained. A right anterolateral thoracotomy planned with availability of blood and bed ventilator.

Preoperatively SpO_2 was 97% on room air. Standard monitoring was instituted inside the operation theatre. Inhalation induction was done with sevoflurane, after confirming ability to ventilate, iv fentanyl 20µg and glycopyrrolate 0.2mg, propofol 20mg was given. (IV induction in a compromised airway may be controversial) Rocuronium 5mg iv given and trachea intubated using 5.0 mm cuffed ETT. Epidural catheter inserted in T_{11}-T_{12} intercostal space with 19 G Tuohy Needle and 20 G catheter. Anaesthesia maintained with O_2, sevoflurane and rocuronium. Analgesia was supplemented with epidural 2.5 ml 0.25% bupivacaine and iv paracetamol. During surgery, patient remained hemodynamically stable. Chest closed after placing an ICD. At the end of the surgery, neuromuscular blockade reversed with neostigmine and glycopyrrolate after spontaneous respiratory efforts present, and trachea extubated and patient shifted to recovery room. Post-operative analgesia was provided with paracetamol iv 8 hourly and epidural 2.5ml of0.125% bupivacaine.Epidural catheter removed on day 3 and and the patient discharged from the hospital on day4.

DISCUSSION

Clinically, infants with mediastinal mass mostly present with respiratory distress. Children may be asymptomatic or may present with history of cough, dyspnoea, dysphagia and frequent chest infections.[3] Anesthesia for these patients, especially children, can be challenging. Induction of anesthesia in these patients can lead to collapse of mediastinal mass on airway or major vessels, leading to life-threatening airway and circulatory compromise even in previously asymptomatic patients. General anesthesia decreases functional residual capacities of both lungs. Muscle relaxation eliminates normal trans-pulmonary gradient, thus exacerbating airway compression. So, maintaining spontaneous respiration is preferred especially in symptomatic patients, particularly those with more than 50% tracheal compression or FEV_1 ≤50% predicted.[4] Compression of the dependent lung in the lateral decubitus position may cause atelectasis. Surgical retraction or single lung ventilation results in collapse of the operative lung. Hypoxic pulmonary vasoconstriction may be diminished by inhalational anesthetic agents and other vasodilating drugs.[5]The overall effect of the lateral decubitus position on V/Q mismatch is different in infants compared to adults. Complications are more in infants and children due to decreased cardiopulmonary reserve and relatively soft airways, which are more susceptible to compression, leading to partial collapse, emphysematous chest, and respiratory infections.[6]

So, a thorough preoperative evaluation with appropriate imaging and laboratory studies is essential in caring for the pediatric patients scheduled for thoracic surgery. Following induction of anesthesia, placement of an intravenous catheter, tracheal intubation, and arterial catheterization (not indicated for short thoracoscopic procedures) should be performed for most patients undergoing thoracotomy as well as those with severe lung disease undergoing VATS. A good peripheral intravenous access is generally adequate for projected fluid and blood administration. Inhalational anesthetic agents are commonly administered in 100% oxygen.[7]

Awake fiberoptic guided intubation, the method of choice in adults, is not always practical in children. Inhalational or IV induction can be done. Partially obstructed respiration, may however occur during an inhalational induction, generating large negative pressures which can further flatten the already weakened trachea.[8] We preferred inhalational induction and only after confirming ability to ventilate iv thiopentone/propofolalong with muscle relaxant was given to facilitate smooth intubation.

CONCLUSION

The anesthesiologist faces many challenges in infants and children undergoing thoracic surgery. A thorough understanding of the primary underlying lesion as well as associated anomalies, respiratory physiology and anatomy in infants and children is required for appropriate perioperative care. Use of multimodal analgesia including regional anesthetic techniques, including epidural anesthesia and analgesia, facilitates optimal postoperative pain control and pulmonary function.

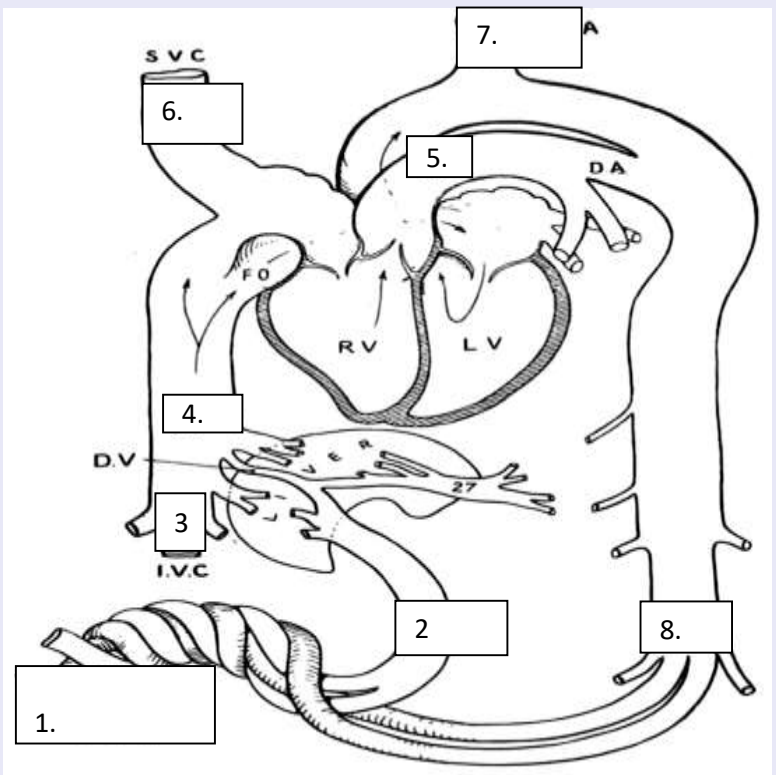
REFERENCES:

1. Ferrari LR, Bedford RF. General anesthesia prior to treatment of anterior mediastinal masses in pediatric cancer patients. Anesthesiology. 1990;72:991-5
2. Robie DK, Gursoy MH, Pokorny WJ. Mediastinal tumors – Airway obstruction and management. Semin Pediatr Surg. 1994;3:259–66.
3. Bray RJ, Fernandes FJ. Mediastinal tumors causing airway obstruction in anaesthetized children. Anaesthesia. 1982;32:571-5.
4. Elmatite W, Upadhyay S, Alfahel W, et al. Anesthetic Management for Anterior Mediastinal Mass with Strong Family History of Malignant Hyperthermia. Am J AnesthClin Res. 2018;4(1):15-8.
5. Thakur P, Bhatia PS, Sitalakshmi N, et al.Anaesthesia for mediastinal mass. Indian J Anaesth. 2014;58(2):215–7.
6. Hammer GB. Anaesthetic management for the child with a mediastinal mass. PaediatrAnaesth. 2004;14:95–7.
7. Datt V, Tempe DK. Airway management in patients with mediastinal masses. Indian J Anaesth. 2005;49:344–52.
8. Neuman GG, Weingarten AE, Abramowitz RM,et al. The anesthetic management of the patient with an anterior mediastinal mass. Anesthesiology. 1984;60:144–7.

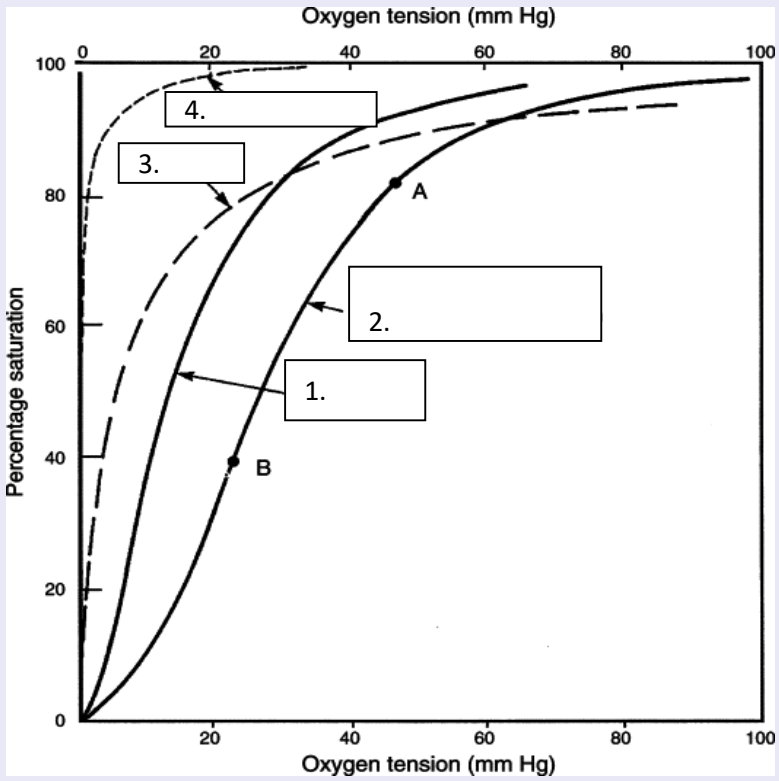
Picture Quiz-

Dr Ekta & Dr Smithamol;CMC Vellore

Q1 - Fill in the boxes with the O2 saturation in fetal circulation



Q3 - Fill in the Blanks



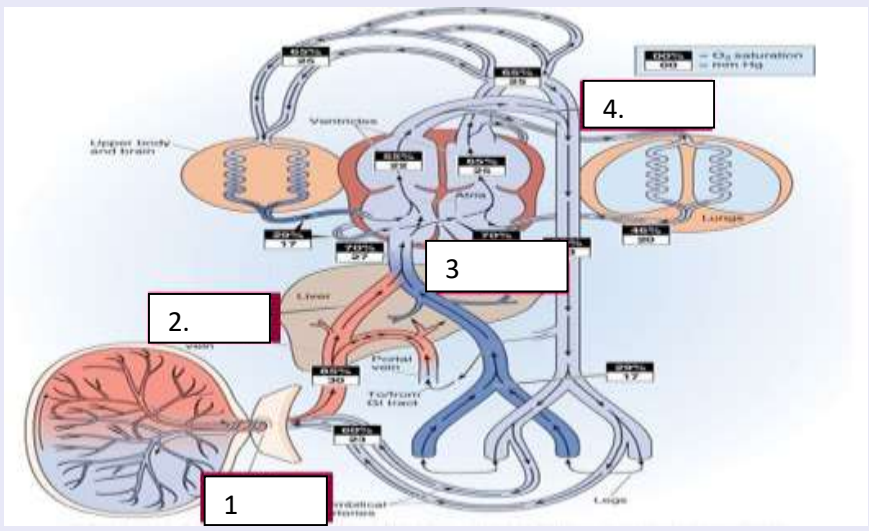
Q2 - Identify the Mask.

Q 4 - Identify the Tube

Q5 Striking finding of the CXR

Q6 Identify the mask and in what conditions will it useful?

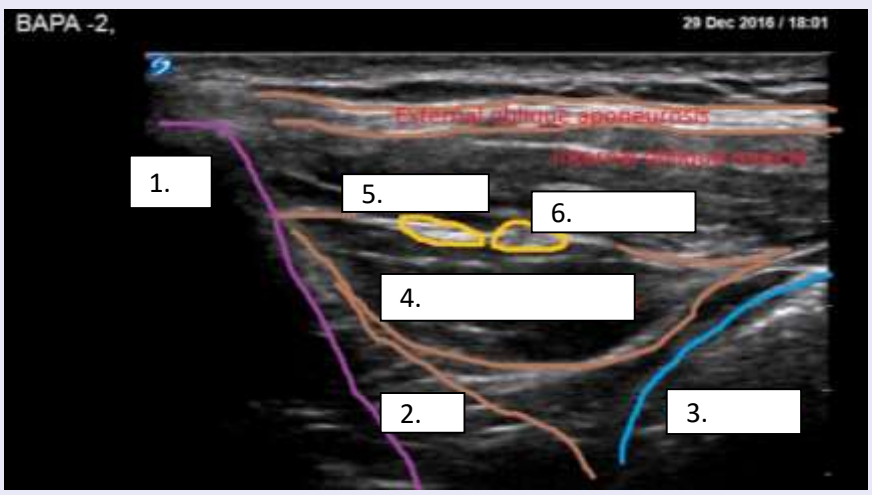
Q7 - Name the normal shunts of fetal circulation



Q8 Identify the mask. MaximumFio2 provided by the same.

Q9 Identify the circuit and how will you set the flows for 3 kg newborn?

Q10 - Identify the structures and when do we block them?



ACTIVITIES-2019

FIRST BI- MONTHLY MEET- IAPA TELANGANA BRANCH-5th March 2019

IAPA Telangana Branch, First Bi-Monthly Meeting, March 2019, Hyderabad

The IAPA Telangana State Branch has made continuous and tireless efforts to promote clinical and academic activities in the field of Pediatric Anesthesia. It is the first individual State Branch of the IAPA to be established. The decision to conduct bi-monthly clinical meetings by the IAPA Telangana Branch was taken during the last general body meeting.

The first clinical meet was held on 5thMarch 2019 in the Dr KPrabahavati Seminar Hall, Department of Anesthesiology,Niloufer Hospital, Hyderabad. The meeting was graced by the presence of prominent dignitaries of both the ISA and the IAPA National executive committee and forty practicing anesthesiologists from various institutions actively participated. The program included presentation of interesting clinical cases from local teaching hospitals. The scientific session included interesting topics like :Role of LMA in neonatal bronchoscopy and subglottic stenosis This session was chaired byDr KPrabhavati and Dr. M.S.R.C.Murthy. The discussions that followed by interactions and comment which were very interesting. This was followed by a simple but sumptuous dinner.

IAPA Bengal CME-27th April 2019

The 3 rd CME on Pediatric Anesthesia by the Bengal chapter of IAPA was organised on 27th April, 2019. The event was presided by Chairpersons Prof Bibhukalyani Das, Prof Jyotsna Basu and Prof Sudakshina Mukherjee. 122 pediatric Anesthesiologists attended the sessions held at the GLT auditorium of SSKM Hospital. The session included basic lectures on neonatal physiology along with PBLD (Problem based learning Discussions) on case scenarios. Two case scenarios ,congenital hypertrophic pyloric stenosis and thalassemia child posted for spleenectomy were used for problem based discussion on" perioperative intravenous fluid management in children" . The panelists for this topic were Dr Samarendra Nath Samui, Associate Professor and HOD, Purulia Medical College, and Dr Purba Halder, Associate Professor, Rampurhat Medical College. Dr Rashmi Chakraborty, spoke on "How physiological are we?" . Dr Kuntal Bhowmick, Pediatric Surgeon, ICH, Dr Debasish Mitra, HOD, Pediatric Surgery, Apollo Gleneagles Hospital, and Dr. P P Giri, Pediatrician and Intensivist, ICH, were present as guest faculties who provided important overviews and practical insights on aspects of pediatric surgery, pediatric medicine and intensive care. Among the participants were a few postgraduates with interest in pediatric anesthesia, a significant number of practicing anesthesiologists with over 10 to 20 years of post-qualification experience as well as few senior pediatric surgeons.. Most of the participants agreed that the contents of the CME were aligned to their needs, and that topics covered in the sessions were relevant to them. Almost all the participants found the interaction with speakers to be enlightening and professionally helpful. Dr Indrani Mitra, on behalf of the Bengal chapter of IAPA, felicitated the speakers and delivered the concluding address and expressed gratitude to the speakers, participants and the host for their support that made the program a successful event.

Report on ASPA PPLS and TTT programme June 29th 30th 2019

I am pleased to inform you that the IAPA and ASPA together have organised the Pediatric Perioperative Life Support (PPLS) Workshop and Training the Trainer (TTT) Programme in Kolkata onJune29th and 30th 2019. This was conducted at the Park Clinic in Kolkata under the able leadership of Dr Indrani Mitra (who unfortunately could not attend, due to unforeseen circumstances) and Dr Anisha De along with her enthusiastic team.

The ASPA Faculty included Drs Elsa Varghese, Dr Anisha De, Dr Falguni, Dr Sapna Batla and Dr Madhavi R

The objective of organizing this programme was to familiarize practicing pediatric anesthesiologistsfrom various institutions in Kolkata with PPLS and to train these anesthesiologists to be Trainers of the PPLS programme to spread safe practices in West Bengal and the North Eastern region of India. The following doctors participated in the TTT course as well: 1. Dr Arpita Chaudhury, 2. Dr Amrita Roy, 3. Dr Anjana Bose,4. Dr Bibhukalyani Das, 5. Dr Bhagya DV, 6. Dr Chiranjib Bhattacharya, 7. Dr Gauri Mukherjee,8. Dr Gunadhar Jana,9. Dr Ashok Ghosh, 10. Dr Kabita Dubey,11. Dr Kasturi Hossain Bandopadhyay, 12.Dr Koel Mitra,13. Dr Rakhi Khemka,14. Dr Ratul Kundu, 15. Dr Shailesh Kumar,16. Dr SarbariSawaika, 17. Dr Soumyo Chakrabarti, 18. Dr Sraboni Das Mahapatra, 19. Dr SudeshnaBhar Kundu, 20. Dr Sushmita Bhattacharya, 21. Dr Suchismita Pal

The PPLS programme on June 29th2019 was an intensive one-day programme. Twenty-two anesthesiologists participated. Short lectures included the following topics: common causes of perioperative cardiac arrests, recognition of the critically ill child, update on pediatric resuscitation, effective team work during crisis, recognition and management of arrhythmias, and breaking bad news. These talks were interspersed between small group interactive case discussions. The cases discussed included the following: recognition of the airway at risk, fluid resuscitation in the hypovolemic child, desaturation in recovery, tight bag, unexpected cardiac arrest in an infant after a caudal and sudden fall in $EtCO_2$in an infant during surgery. Post lunch, the participants rotated through three Skills Stations which included: recognition and management of arrhythmias, effective CPR skills and team work, IV access). All participants were very enthusiastic and actively contributed in the group discussions and skill stations.

The TTT (half day) programme was conducted on June 30th2019 with twenty-one participants (all had participated the previous day) and the main faculty was Dr Elsa Varghese with the others observing and assisting her. A review of the prior PPLS workshop in terms of the objectives, format, quality and consistency of sessions was open for discussion and improvement. Dr Elsa delivered a brief overview on how to teach small groups, following which the participants were divided in to three groups, were provided a case, and each group had a practice run of case- based discussions followed by comments and feedback. This was followed bya talk on how to facilitate Skill Station teaching. Following this, practice runs of skill stations for effective CPR, management of arrhythmias, working as a team (video was played) and breaking bad newswith role play. I must congratulate the participants on their wholehearted involvement and excellent role playing in the various scenarios. We look forward to taking the PPLS programme forward in a big way across India.

Dr Elsa Varghese

Answers to crossword

Down

1. Mapleson
2. Phenylephrine
5. Buchenne
6. Kernicterus
8. Apgar
9. Moyamoya
12. Teratoma

Across

3. Hydrops
4. Ctev
7. Oculocardiac
10. Achondroplasia
11. Stridor
13. Klinefelter
14. Hyperoxia
15. Porphyria
16. Wilms
17. Volvulus

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- Minimal Monitoring
- Sedation

More guidelines soon……

Simulation Workshop organized by Christian Medical College, Vellore in collaboration with IAPA, July 2019

An intense one-day Hands-on Simulation Workshop on Crisis Management in adults and children was organized at Christian Medical College, Vellore in collaboration with the IAPA in July. Seven high fidelity manikins were utilized for various stations and delegates went through various crisis scenarios. 70 delegates were allowed to register and the number restricted for adequate hands on experience (though many more were interested but denied). Visiting faculty included Dr Indu Sen, Dr Elizabeth Joseph, Dr Ebor Jacob, Dr Debasis Adhikari, Dr Kishore Pichumutthu, Dr Prince James, Dr Richa Gupta and thirty other faculty from the Dept of Anaesthesiology, CMCH Vellore. Laedral® supported this programme by supplying three high fidelity manikins and four technicians to run the programme.
Dr Raj Shahajananda, organizing chairperson welcomed delegates and Dr Ekta Rai, organizing secretary, emphasized the house keeping rules. A mock station was demonstrated by Dr Ebor Jacob and his team. The programme was intense with stations on difficult airway, LAST, septic shock and arrhythmias for child mannequin. Programme started at 0800 hrs. and wound up by1800 hrs. One skill station was on ICD placementon goats' thorax. Despite a long and intense day, faculty and delegates remained enthusiastic excited till the end of the day of Simulation Workshop. The day ended with a vote of thanks by Dr Ekta Rai and mementos were distributed to faculty. Feedback from delegates, technicians, faculty and Laedral company representatives. Delegates were extremely happy with hands on stations and feedback positive.

Accredited Institutions

1. Rainbow Hospitals, Hyderabad.
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4. Chacha Nehru Bal Chikitsalaya, New Delhi.
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5. Amrita Institute of Medical Sciences, Kochi.
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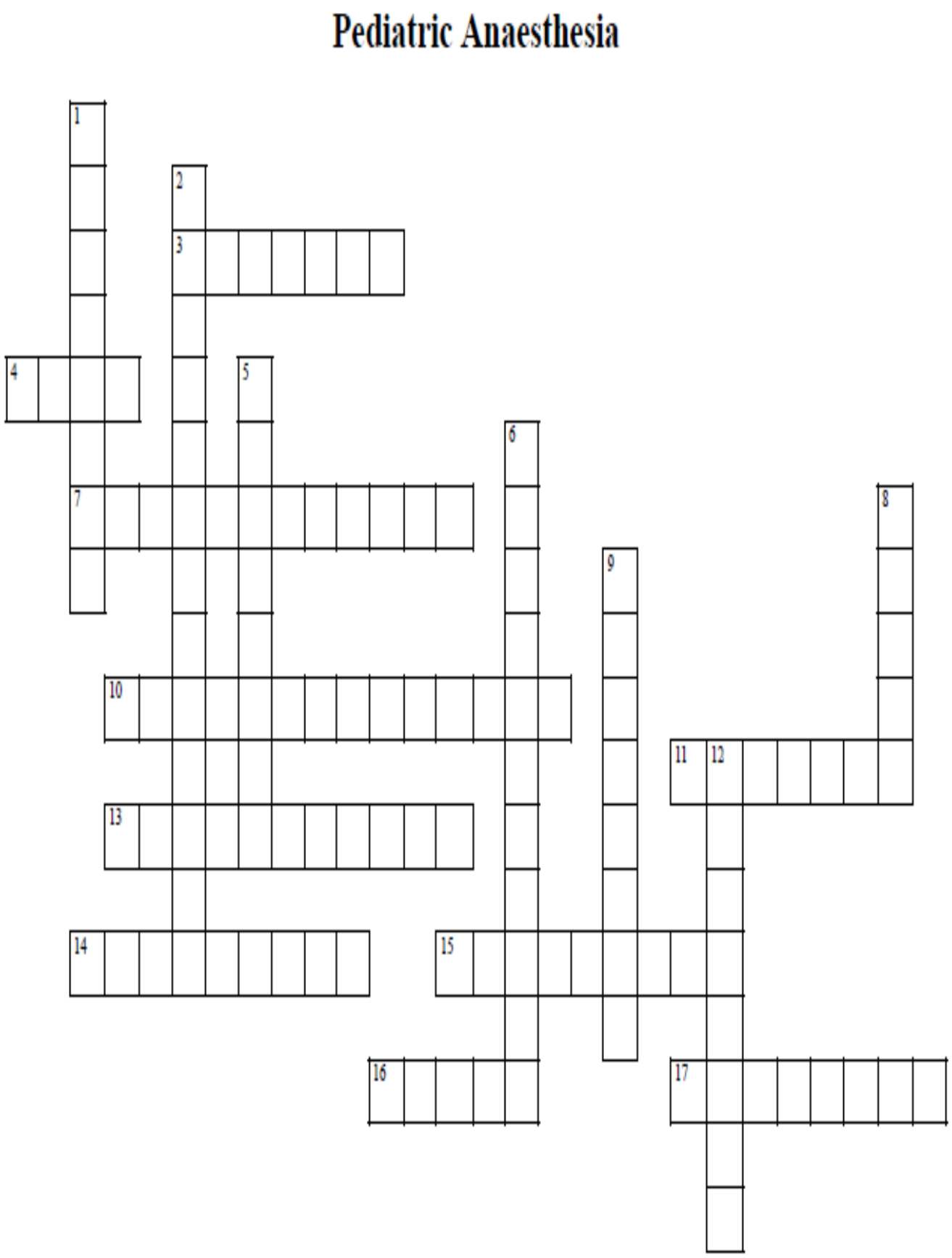
Crossword

Dr. Vibhavari Naik, Hyderabad



Across

3. Serious foetal condition with abnormal fluid collection

4. Clubfoot

7. Reflex causing bradycardia during pressure on the eye

10. Dwarfism due to abnormal cartilage formation

11. Upper airway obstructive sound

13. 47, XXY syndrome

14. Major risk factor for retinopathy of prematurity

15. Defective heme synthesis disease

16. Kidney tumour in children

17. Twisted loop of intestine

Down

1. Semiclosed rebreathing system classification

2. Alpha 1 agonist used in treatment of Tet spell

5. X-linked muscular dystrophy due to lack of dystrophin

6. Unconjugated bilirubin deposition in brain

8. Five component score for newborn assessment

9. Cerebrovascular disease, Japanese word for puff of smoke

12. Large solid cystic region arising in sacrococcygeal region