CASE REPORT

Anesthesia Concerns in the Management of Low Birth Weight Neonate for Giant Sacrococcygeal Teratoma Excision: Case Series of Two Cases

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ABSTRACT

Sacrococcygeal teratomas (SCTs) are the most common tumor of newborn, originate from embryogenic germ cell layers. Often the tumor is small and presents as a lump in sacral region. The SCTs found in newborn period are usually benign and cystic in nature but 1–2% chances for malignant transformation. We hereby report successful anesthetic management of two cases of low-birth weight neonate; posted for giant SCT excision.

Key words: Anesthesia management, giant sacrococcygeal teratoma, neonate

INTRODUCTION

Sacrococcygeal teratomas (SCT), is an unusual tumor that develops before birth, is located at base of the coccyx it is usually covered with either skin or membrane and has many blood vessels coming through them. These are the most common perinatal germ cell tumors which originate from primordial pluripotent cells.[1,2] The majority have a sporadic origin with incidence of 1 in 35,000–40,000 live births.[3,4] Female individuals are affected more frequently with a female-to-male ratio of almost 4:1.[5] About 18% of these infants have additional congenital anomalies.[6]

The primary treatment of SCTs is early surgical resection with complete excision of the coccyx.[7] Early surgical intervention is associated with better prognosis[8] malignant tumors require surgical excision, chemotherapy, and radiation.

CASE REPORT: 1

Neonate with giant sacrococcygeal teratoma at 38 weeks of gestation delivered by cesarean section. Patient weighs approximately 1.9 kg without tumor. On 16th day, he was posted for excision. Detailed antenatal and drug history from mother were taken, family history was not significant. Thorough pre-anesthetic evaluation was done; on examination baby is comfortably lying with oxygen hood; pulse 134 bpm; respiratory rate 50/min; and anterior fontanelle is open and nonbulging. On auscultation systolic murmur with bilateral clear breath sounds was heard. On local examination, well-defined large cystic mass of approximately 13 cm × 10 cm located at sacrococcygeal region [Figure 1]. All laboratory parameters were within normal limit, C-reactive protein was negative, two-dimensional (2D)-echo was suggestive of 5 mm atrial septal defect, 3 mm patent ductus arteriosus, dilated right atrium, and right ventricle, with mild pulmonary hypertension. Computer tomography revealed 13.3 cm × 9.2 cm × 18.4cm well-defined solid cystic mass supplied by dilated branches of abdominal aorta (maximum diameter of 3.5 mm with median and sacral branches of aorta). OT preparation was done with difficult airway cart, prone position preparation, warmers to prevent hypothermia, and all other neonatal resuscitative measures. Preoperatively, two large intravenous catheters were secured. The giant sacrococcygeal

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tumor was placed on a adequate size doughnut with rest of the body on a pillow and tracheal intubation was achieved with sevoflurane induction and muscle relaxation with atracurium. To prevent microlaryngeal aspiration throat packing was done. Prone position was given resulted increased airway pressure (40 mmHg) [Figure 2] with dropped saturation up to 78% on 100% oxygen and heart rate 98 bpm. Hence, mass was lifted and position was re-adjusted with manual ventilation and removal of traction. Normothermia 35.6–37°C was maintained using warm IV fluids and by drapping head, upper and lower limbs of the baby with plastic drape and cotton sheets. Total surgical resection including coccygectomy was done. Intraoperative blood loss was replaced by 70 ml packed red blood cells. After completion of surgery patient was positioned supine, throat pack was removed and gentle oropharyngeal suctioning was done. After returning of spontaneous respiration and cough reflex patient was reversed by inj. glycopyrrolate 10 ug/kg and inj. neostigmine 0.05 mg/kg and extubated.

CASE REPORT: 2

A 1.6 kg female baby, 12 days old was born prematurely by cesarean section presented with huge mass 10 × 12 cm located in sacrococcygeal region and no other congenital anomaly was present. Elective SCT excision was planned.

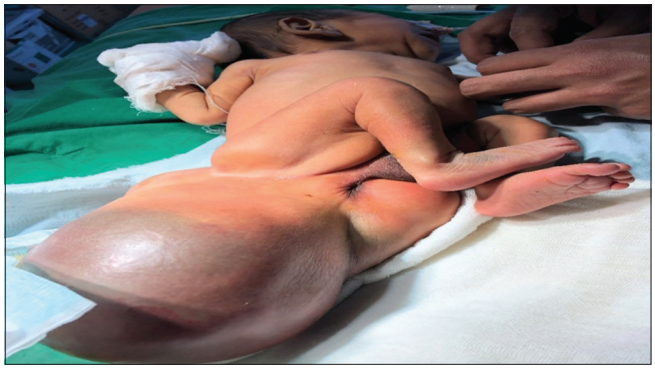

Figure 1: Neonate with giant sacrococcygeal teratoma

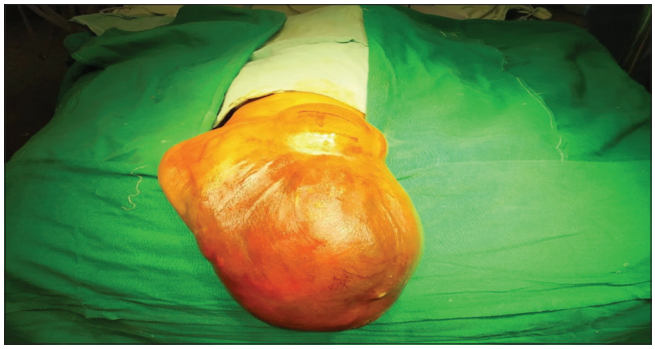

Figure 2: Neonate with giant sacrococcygeal teratomas in prone position

Her laboratory parameters and 2D ECHO were within normal limit [Figure 3]. Nil by mouth hours before surgery are confirmed and maintenance fluid 4 ml/h was started. Preinduction monitor such as non-invasive blood pressure, electrocardiography, and SPO_2 was attached and anti-aspiration prophylaxis inj ondansetron 0.15 mg/kg, and inj glycopyrrolate 5 µg/kg were given. Inhalational induction with sevoflurane was done and tracheal intubation was facilitated with 2.5 mm uncuffed endotracheal tube. Intraoperatively anesthesia was maintained with oxygen, sevoflurane, and inj atracurium 0.5 mg/kg loading, and 0.1 mg/kg for maintenance dose. Duration of surgery was 2.5 h. On table extubation was not done in view of prematurity and hemodynamic instability shifted to neonatal intensive care unit for observation and further management. Post-operative analgesia was given with paracetamol suppository 40 mg/kg. The post-operative recovery was uneventful.

DISCUSSION

SCT, is an unusual tumor that develops before birth, is located at base of the coccyx it is usually covered with either skin or membrane and has many blood vessels coming through them. These are the most common perinatal germ cell tumors which originate from primordial pluripotent cells.[1,2] The majority have a sporadic origin with incidence of 1 in 35,000–40,000 live births.[3,4]

Anesthesia concern

- Prematurity
- Difficult intravenous access
- Difficult airway
- Massive blood loss
- Prone positioning
- Cardiovascular instability
- Hypothermia
- Associated congenital anomaly
- Tumor lysis resulting electrolyte imbalance
- Delayed post-operative recovery.

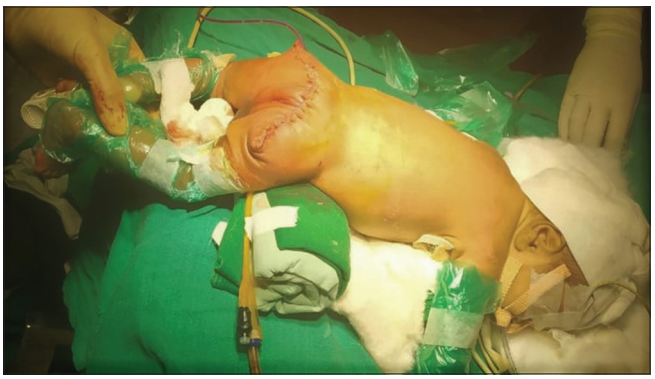

Figure 3: Neonate after giant sacrococcygeal teratoma excision

The multiorgan involvement makes the anesthetic management challenging. The associated anomalies in SCT include hydrocephalous, spina bifida, cleft lip and cleft palate, polydactyly, transposition of great vessels, neurogenic bladder, hypospadias, epispadias, and ectopic kidney. Patient is at risk of hypovolemic shock because of high vascularity of tumor and large pelvic venous bed intra tumor arteriovenous fistula. Massive transfusion in such patient causes disseminated intravascular coagulopathy and dilutional coagulopathy. Long hours of surgery require close vigilance of temperature regulation and fluid balance, as patient is at risk of high output heart failure. Anesthetizing a neonate requires meticulous planning and constant vigilance so there should be an experienced anesthesiologist in the operating room. Hypothermia itself worsens coagulopathy and can lead to fatal consequences.

Measures to prevent hypothermia

- Increasing the ambient temperature of operation theater at 27°C
- Wrapping the patient with warm blankets
- Proper covering of baby's head
- Use of radiant warmers
- Fluid warmers
- Humidified inspired gas.

Surgical complication includes nerve and muscle disruption of pelvic and perineal region which leads to bowel and bladder dysfunction. Hyperkalemia and hypocalcemia because of tumor lysis are the major concerns as they by increases the plasma concentration of anion which chelates free calcium and result in hypotension, cardiac failure, arrhythmias, and cardiac arrest.[9]

CONCLUSION

Excision of SCT leads to complications such as respiratory complication, hypothermia, and electrolyte imbalance because of tumor lysis, massive hemorrhage, and dilutional coagulopathy. Hence, meticulous planning and vigilant monitoring during intraoperative and post-operative period are key for favorable neonatal outcome. We hereby, report successful anesthetic management of two cases with giant SCT posted for excision.

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