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Croup in Children

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Abstract

Croup is one of the most common causes of upper airway obstruction in young children. Upper airway inflammation produced by a viral infection causes a barky cough, hoarse voice, inspiratory stridor, and respiratory discomfort. It causes upper airway blockage and must be distinguished from acute epiglottitis, bacterial tracheitis, or foreign body inhalation. Croup affects roughly 3% of children each year, mostly between the ages of 6 months and 3 years, and the parainfluenza virus is responsible for 75% of cases. Symptoms normally go away after 48 hours, but severe upper airway blockage might cause respiratory failure and arrest in rare cases. The degree of respiratory distress and accompanying findings must be the emphasis of the patient's examination. It is necessary to rule out the likelihood of foreign body aspiration and epiglottitis. The efficacy and safety of corticosteroids (intramuscular and oral dexamethasone), nebulized budesonide, oral prednisolone, heliox, humidification, and nebulized adrenaline are all investigated (racemate and L-adrenaline [epinephrine]). The provision of humidified air is the most crucial part of management. Children with moderate to severe croup benefit from racemic epinephrine and steroids. Children with restless stridor, tiredness, poisoning, or respiratory distress should be admitted. Active airway intervention is unusual, but if a blockage develops, it can save a life.

Keywords: Croup; upper airway obstruction; inspiratory stridor; respiratory failure; Dexamethasone; Racemic epinephrine.

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INTRODUCTION

Laryngitis, laryngotracheitis, laryngotrach eobronchitis and bacterial tracheitis, or spasmodic croup are the upper respiratory infections which produce inspiratory stridor, barking cough, and hoarseness in infants.[1] Hoarseness is more common in older children and adults than in newborns and young children, who have a barking cough. The presence of chest wall retractions and stridor at rest are two of the most crucial clinical markers.

EPIDEMIOLOGY

The most common age group is 6 to 36 months. It's more common in three-month-old babies and preschoolers, but it's uncommon in children older than six.[2] Male: Female ratio of about 1.4:1.[3] The majority of occurrences happen in the fall or early winter. Children remain contagious for three days or until the fever goes away, whichever comes first. Croup and recurrent croup are linked to a family history of the illness. In a case-control study, children with croup-prone parents were 3.2 times more likely to have an episode of croup and 4.1 times more likely to have recurring croup than children without croup-prone parents. Parental smoking, which is known to increase the risk of various respiratory tract infections in children, does not appear to increase the risk of croup.[4]

ETIOLOGY

Croup outbreaks can be caused by type 1 parainfluenza virus, which causes a milder sickness than type 1, and type 3 parainfluenza virus (sporadic croup), which is more severe than types 1 and 2. According to Frost HM and Robinson CC, Croup was the most common discharge diagnosis for children with verified parainfluenza 1 (42%), parainfluenza 2 (48%), but only 11% of children with confirmed parainfluenza 3 infections. Type 4 parainfluenza virus infection is less likely to induce stridor and croup in children than types 1–3.[5,6] RSV, adenoviruses, measles, influenza (longer hospitalization and a higher risk of recurrence of laryngeal symptoms), enteroviruses (Coxsackie types A9, B4, and B5, as well as echovirus types 4, 11, and 21), rhinoviruses, herpes simplex virus, and metapneumoviruses needs longer hospitalization and has higher risk of readmission for relapse of laryngeal symptoms. The 2004 discovery of human coronavirus NL63 (HCoV-NL63) which has been related to croup and other respiratory illnesses.[7] Croup has been linked to the SARS-CoV-2 virus, however this appears to be a rare presentation of this viral infection in youngsters.[8]

PATHOPHYSIOLOGY

The subglottic constriction of the trachea is the anatomic signature ("fixed" obstruction). When a youngster resists, cries, or becomes agitated, the extrathoracic trachea becomes dynamically obstructed below the cartilaginous ring. Fibrinous exudates and, on rare occasions, pseudo membranes can be found. Bacterial tracheitis–Bacterial tracheitis which is caused by a superadded bacterial infection that causes thick pus formation within the subglottic trachea lumen. The mucosal surface develops ulcers, pseudo membranes, and forms a micro abscess In most cases, the supraglottic tissues are normal. Host factors Subglottic stenosis or laryngeal web and hyperactive airways are exacerbated by atopy (spasmodic or recurrent croup).[9] Airway narrowing caused by respiratory tract papillomas (human papillomavirus) or scarring after intubation.

CLINICAL FEATURES

Laryngotracheitis

Occurs in children three months to three years of age.[10] Gradual onset of nasal irritation, congestion, and coryza, followed by fever, hoarseness, barking cough, and stridor over 12 to 48 hours. Allow three to seven days for the symptoms to subside before returning to normal. Severe upper airway blockage is indicated by suprasternal, subcostal, and intercostal retractions, as well as reduced breath sounds. Hypoxia, cyanosis, respiratory exhaustion, and death are all possible outcomes.

Spasmodic croup

It occurs in children aged three months to three years [10]. It invariably occurs at night; the symptoms are transient; and the onset and termination of symptoms are rapid. Fever is usually not present. Episodes can repeat itself on the same night or for two to four nights in a row. With a family history of allergies, there may be a genetic predisposition. The episodic character of the episodes and the child's relative well-being between them distinguish it from classic croup, which has constant symptoms.

Bacterial tracheitis

It could show up as Primary infection: upper airway obstruction symptoms arise suddenly, with a fever and a poisonous look. Secondary infection: substantial deterioration of viral laryngotracheitis over the clinical course, with high fever, poisonous look, and increased respiratory discomfort due to tracheal blockage from purulent secretions.

RAPID ASSESSMENT AND INITIAL MANAGEMENT

To identify the children with severe respiratory distress and/or impending respiratory failure, a rapid assessment of general appearance of the child which includes the presence of stridor at

rest and vital signs which consists of heart rate, respiratory rate and saturation of the child with airway stability, and mental aptitude is required. Checking on the child's hydration is also a good idea. Dehydration has been associated to moderate to severe croup due to decreased oral intake and increased insensible losses due to fever and tachypnea. Croup can be distinguished from other causes of acute upper airway blockage by the following characteristics: Fever–if child dosen't have fever in between the initiation of symptoms and the presentation of symptoms which suggests spasmodic croup or another noninfectious aetiology (eg, subglottic cyst, subglottic hemangioma). A barky, seal-like cough is the hallmark physical finding in a patient with subglottic constriction. Hoarseness-While hoarseness is a common symptom of croup, especially in older children, it is not a sign of epiglottitis or foreign body aspiration. Difficulties swallowing-Acute epiglottitis can make swallowing difficult. Drooling is a common symptom of peritonsillar or retropharyngeal abscesses, retropharyngeal cellulitis, or epiglottitis in children. Drooling was found in around 80% of children with epiglottitis but just 10% of those with croup in an observational study.[11] Throat pain - Dysphagia and sore throat are more common symptoms in children with epiglottitis than in children with croup.

ASSESSMENT OF SEVERITY

[12] Westley croup score: [1] Consciousness level: normal (including sleep) = 0; confused = 5. [2] Cyanosis: None = 0, agitation = 4, repose = 5. [3] Stridor: none = 0, agitation = 1, repose = 2. [4] Normal = 0, lowered = 1, and significantly decreased = 2. [5] None = 0, mild = 1, moderate = 2, and severe = 3.

Mild croup: Westley croup score of ≤ 2. Moderate croup: Westley croup score of 3 to 7. Severe croup: Westley croup score of ≥ 8.

Respiratory failure

The following signals foreshadowed it: (1) Tiredness and sluggishness (2) Highlighted retractions (retractions may decrease with increased obstruction and decreased air entry) (3) Breathing sounds that are reduced or non-existent (4) a lack of consciousness (5) Disproportionate tachycardia (7) Cyanosis or pallor.

ASSESSING FOR OTHER CAUSES

Elements of the physical examination can help distinguish croup from other causes of acute upper airway blockage and respiratory distress. Epiglottitis patients frequently prefer to sit up straight in the "tripod" or "sniffing position" (neck is mildly flexed, and head is mildly extended). Voice quality-Croup patients may have a hoarse voice or a feeble cry. A muffled "hot-potato" voice can be caused by epiglottitis, retropharyngeal abscess, or peritonsillar abscess.

Examination of the oropharynx for the following signs

Excessive salivation, which could be a sign of acute epiglottitis, peritonsillar abscess, parapharyngeal abscess, or retropharyngeal abscess. • Diphtheritic membrane • Tonsillar asymmetry or uvula deviation suggestive of peritonsillar abscess • Midline or unilateral enlargement of the posterior pharyngeal wall suggestive of retropharyngeal abscess.[11-12]

DIAGNOSIS

Clinical diagnosis: The occurrence of a barking cough and stridor, particularly during a typical community outbreak of one of the causal viruses.

Direct laryngoscopy: Noninflammatory edema in spasmodic croup. Bacterial tracheitis is characterised by thick pus, ulcerations, pseudomembranes, and mucosal surface microabscesses. Normally, the supraglottic tissues are normal.

IMAGING

Indications: (1) Doubtful diagnosis (2) Atypical course (3) Suspected inhaled or swallowed foreign body (4) Recurrent croup, and Inability to respond to therapeutic interventions. An X-ray of the chest can reveal subglottic constriction, often known as the "steeple sign." During inspiration, the lateral view may indicate hypopharyngeal overdistention and subglottic haziness. The epiglottis should be in good shape.

Greater tracheal constriction on a frontal or lateral plain radiograph was associated with a higher risk of admission and a longer hospital stay, according to Yang WC et al.[13]

Laboratory studies: Rarely indicated, limited diagnostic utility, but may help guide management in more severe cases.

Blood tests: Serum chemistries indicate no apparent changes, but dehydrated children may have low serum bicarbonate and/or increased blood urea nitrogen.

Microbiology: Confirmation of etiologic diagnosis is not necessary for majority.

Differential Diagnosis: (1) Acute epiglottitis (2) Retropharyngeal and peritonsillar abscesses (3) Aspiration or swallowing of foreign bodies (4) Allergic response (5) Angioneurotic edema (acute) (6) Injury to the upper airway (7) Upper airway congenital abnormalities Diphtheria of the larynx.

TREATMENT

There is no cure for the viruses that cause croup. Pharmacologic therapy to reduce airway edema, respiratory assistance, and hydration maintenance. Symptomatic treatment includes humidity (92 percent oxygen saturation in room air), fever lowering, and water. If the condition worsens, use bag mask ventilation and advanced airway procedures. Dexamethasone (0.6 mg/kg, maximum dose of 10 mg), administered using the least intrusive method possible: oral if tolerated, IV if access is accessible, and intramuscular if oral is not tolerated and IV access is not available. Racemic epinephrine in the form of 0.05 mL/kg per dosage (maximum of 0.5 mL) of a 2.25 percent solution mixed to 3 mL total volume with normal saline and administered via nebulizer over 15 minutes. L-epinephrine as 0.5 mL/kg per dose (maximum of 5 mL) of a 1:1000dilution given via nebulizer over 15 minutes.

Nebulized Budesonide: For children with vomiting or severe respiratory distress, nebulized budesonide (2 mg [2 mL solution] via nebulizer) may be an option to IM or IV dexamethasone. Budesonide may be combined with epinephrine and delivered concurrently to children experiencing acute respiratory distress.

Hospitalization: Children with moderate/severe croup whose condition worsens or does not improve as expected after nebulized epinephrine and corticosteroids treatment. Fewer than 5% of children with croup require hospitalisation, and of those, 1 to 6% require intubation. Mortality is uncommon, occurring in less than 0.5 percent of intubated children.

Heliox: Not more effective than humidified oxygen or racemic epinephrine in reducing croup scores.

Antibiotics: Use only to treat specific bacterial complications. Antitussives and decongestants: unproven benefit. Sedatives may decrease the work of breathing and improve agitation without actually improving ventilation or hypoxemia.[8-12]

Monitoring

Pulse oximetry, level of consciousness, stridor, cyanosis, air entry, and retractions. Monitor trends in ventilation with capnography

Criteria for Discharge

No stridor at rest, Normal pulse oximetry, Good air exchange, Normal color, Normal level of consciousness, accepting orally.

Complications: (1) Hypoxemia (oxygen saturation <92 percent in room air) (2) Respiratory failure (3) Pulmonary edema, (4) Pneumothorax, and Pneumomediastinum.

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Case Report

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Anemia During Pregnancy

Ekta Bansal[1], Hema Kumari[2], Sneha Kumari[3], S P Subashini[4]

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Abstract

In developing nations, anaemia is one of the most frequent nutritional deficiency illnesses afflicting pregnant women. Anemia during pregnancy is linked to a poor pregnancy outcome and can lead to complications that endanger both the mother and the foetus' lives. In low-income nations, anaemia during pregnancy correlates to a bad outcome for both mother and child. Postpartum haemorrhage, the requirement for blood transfusions, maternal mortality, low birth weight, and perinatal mortality were all examined as negative outcomes. Severe anaemia during pregnancy has a negative impact on both the mother and the foetus. It appears that maternal hazards rise before foetal risks. It is advised that hospitals in low-income countries prioritise the prevention, early detection, and treatment of severe anaemia in pregnancy in order to enhance mother and foetal outcomes.

Key words: Anemia in pregnancy; maternal outcome; fetal outcome; low-income countries.

Abbrevations: Hb: Haemoglobin.

INTRODUCTION

Anaemia during pregnancy is a public health issue, particularly in underdeveloped countries, and is linked to poor pregnancy outcomes. Anemia in pregnancy is defined by a haemoglobin (Hb) content of less than 11 g/dl, according to the World Health Organization (WHO). According to the World Health Organization, anaemia is considered a public health issue or problem when the prevalence of anaemia is 5.0 percent or greater in population research. Anemia with a prevalence of 40% in a population is considered a serious public health issue.

Anemia during pregnancy in impoverished nations is caused by a variety of factors, including micronutrient deficiencies in iron, folate, and vitamins A and B12, as well as anaemia caused by parasite illnesses like malaria and hookworm, as well as chronic infections like tuberculosis and HIV. Geographical location, dietary behaviour, and season all influence the contribution of each of the elements that cause anaemia during pregnancy.

Several types of anemia can develop during pregnancy. These include:

- Iron-deficiency anemia

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- Folate-deficiency anemia
- Vitamin B12 deficiency

Iron-deficiency anemia

This type of anemia occurs when the body doesn't have enough iron to produce adequate amounts of hemoglobin. That's a protein in red blood cells. It carries oxygen from the lungs to the rest of the body.

In iron-deficiency anemia, the blood cannot carry enough oxygen to tissues throughout the body.

Iron deficiency is the most common cause of anemia in pregnancy.

Folate-deficiency anemia

Folate is the vitamin found naturally in certain foods like green leafy vegetables A type of B vitamin, the body needs folate to produce new cells, including healthy red blood cells.

During pregnancy, women need extra folate. But sometimes they don't get enough from their diet. When that happens, the body can't make enough normal red blood cells to transport oxygen to tissues throughout the body. Man made supplements of folate are called folic acid.

Folate deficiency can directly contribute to certain types of birth defects, such as neural tube abnormalities (spina bifida) and low birth weight.

Vitamin B12 deficiency

The body needs vitamin B12 to form healthy red blood cells. When a pregnant woman doesn't get enough vitamin B12 from their diet, their body can't produce enough healthy red blood cells. Women who don't eat meat, poultry, dairy products, and eggs have a greater risk of developing vitamin B12 deficiency, which may contribute to birth defects, such as neural tube abnormalities, and could lead to preterm labor.

Blood loss during and after delivery can also cause anemia.

Anaemia has been linked to poor maternal and child health, as well as an increased risk of maternal and perinatal mortality during pregnancy. Fatigue, low job capability, diminished immunological function, higher risk of cardiac disorders, and mortality are some of the negative health impacts for the mother.

Anaemia is linked to a higher risk of preterm birth and low birth weight kids during pregnancy. Preterm birth and low birth weight continue to be the primary causes of newborn fatalities in underdeveloped countries, accounting for 30% of all deaths. It's also linked to an increased risk of intrauterine deaths (IUFD), a low APGAR score at 5 minutes, and intrauterine growth restriction (IUGR), a risk of stunting in children under the age of two.

CONCLUSION

Anaemia in pregnancy was a minor public health issue. The location of the pregnant woman's household and her educational level were shown to be the most significant risk factors. In this situation, ongoing therapies to combat anaemia during pregnancy appear to be working, and they should be made universally available. Furthermore, we advocate continued education regarding the implications of anaemia, particularly among low-literacy women, adolescent women, and women of reproductive age in general. Among a variety of socio-demographic, nutritional, and preventive service usage characteristics investigated, the women's knowledge of anaemia and pregnant trimester at the time of interview emerged as independent drivers of anaemia. The high level of anaemia in pregnancy necessitates early care to avoid severe maternal and newborn outcomes.

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An Extremely Rare Association of Prune belly Syndrome with Congenital Pouch colon : Case Report and Review of Literature

Nitin Jain[1], Simmi K Ratan[2], Shasanka Shekhar Panda[3], Sujoy Neogi[4]

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Abstract

Prune belly syndrome (PBS) is a triad of an abdominal wall muscular deficiency, cryptorchidism, and dilated urinary tract, and is often associated with other anomalies. Association of PBS with congenital pouch colon is extremely rare with only few handful of such reports in literature. We report here management of this rare associationin a male newborn with multiple genitourinary abnormalities.

Keywords: Congenital pouch colon; Prune belly syndrome; High Anorectal malformation; Megaureter.

INTRODUCTION

Prune belly syndrome (PBS) is a triad of an abdominal wall deficiency in muscular tissue, cryptorchidism, and dilated urinary tract with reported incidence is 1 in 29,000 to 1 in 40,000 live birth.[1] Congenital pouch colon (CPC) is a rare and an unusual high anorectal malformation associated with pouch-like dilatation of a varying degree of shortened colon. CPC is itself an uncommon entity and association with prune belly syndrome is extremely rare with only five such case reports in literature. CPC has a regional preponderancefor India with a review showing that 92.2% of reported cases were from India.[2] We report here management of a male neonate with prune belly syndrome associated with congenital pouch colon and genitourinary abnormalities including severe hydronephrosis, massively dilated tortuous ureters, and congenital megalourethra.

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CASE REPORT

A full-term male neonate (birth weight 2.4kg), with ahistory of antenatally diagnosed bilateral hydroureteronephrosis born by spontaneous vaginal delivery presented with absence of anal opening and progressive abdominal distension. Baby was sick and dehydrated at presentation. Capillary refilling time was >3 seconds. Abdomen was flabby and distended and with visible loops of

intestines. Overlying skin was loose and wrinkled. [Fig.1]

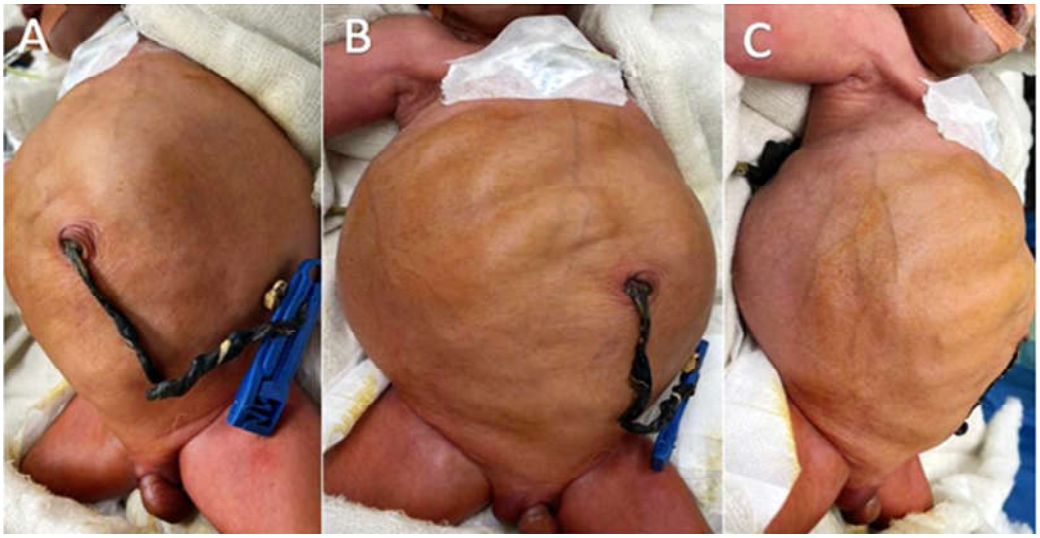

Fig. 1: Showing flabby and distended abdomen with visible loops of intestines

Urine output was low and urine was trickling in drops. Catheterisation was attempted but couldn't be catheterised. On pressing the bladder urine slowly getting filled up in dilated urethra. Anterior urethra was scaphoid megalourethra with absent corporal tissue. Scrotal sac was very small and rugosities were absent. Both testis were absent and impalpable nowhere externally. Anal opening was absent with poorly developed gluteal musculature. Baby was resuscitated with intravenous fluids and nasogastric decompression. Routine investigations were sent. Cross table prone lateral and erect anteroposterior radiograph were done. Radiograph shows high anorectal anomaly and features of pouch colon. [Fig.2] Creatinine

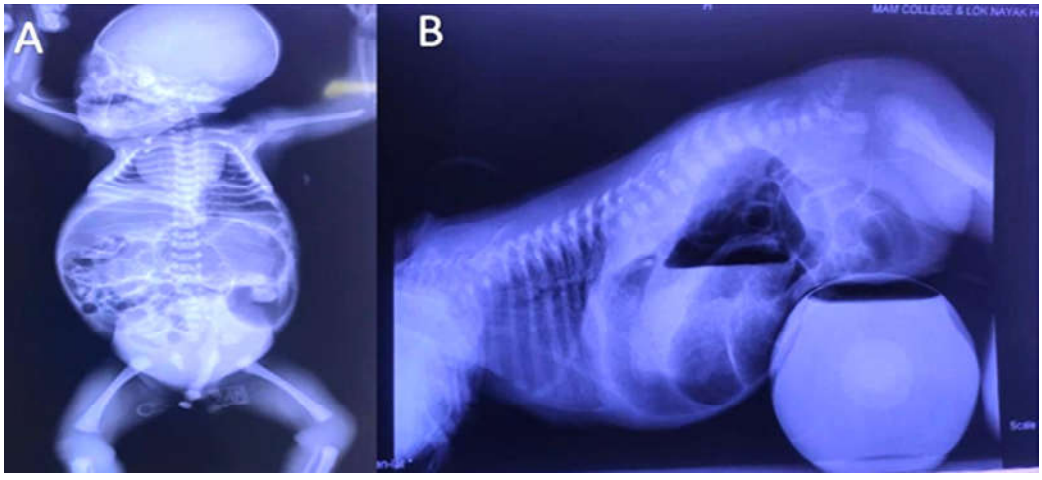

Fig. 2: Showing(A) plain radiograph, Anteroposterior view,(B)Cross table prone lateral view.

was raised (1.8mg/dl) and blood gas analysis showed metabolic acidosis. Antenatal Ultrasound during third trimester showed bilateral hydrourete ronephrosis and oligohydramnios. Post-natal Ultrasound of abdomen showed severe bilateral hydroureteronephrosiswith pelvic diameter on right side was 2.8 cms and on left side was 3 cms along with massively dilated ureters on both sides. On Exploratory laparotomy deficient and loose abdominal wall musculature was evident. Catherization was tried under general anaesthesia but urethra was not catherizable. Type IV pouch colon lacking haustrations, appendices epiploicae, taenia coli with an abrupt transition from the

normal proximal bowel to the distal dilated pouch was identified. [Fig.3] The bladder was also dilated and contained turbid urine. The colovesical fistula was ligated, the pouch colon was excised,

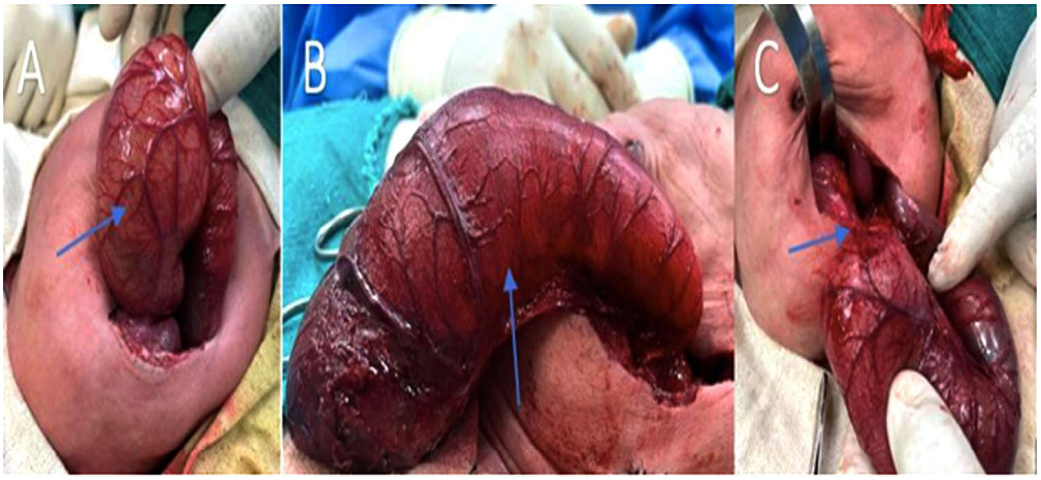

Fig. 3: Showing (A, B & C)Type IV pouch colon lacking haustrations, appendices epiploicae, taenia coli with an abrupt transition from the normal proximal bowel to the distal dilated pouch was identified

and an end descending colostomy was done. In view of massively dilated and tortuous ureters, ureterostomy was done on left side andsuprapubic cystostomy was done. [Fig.4]

In postoperative period baby showed recovery and

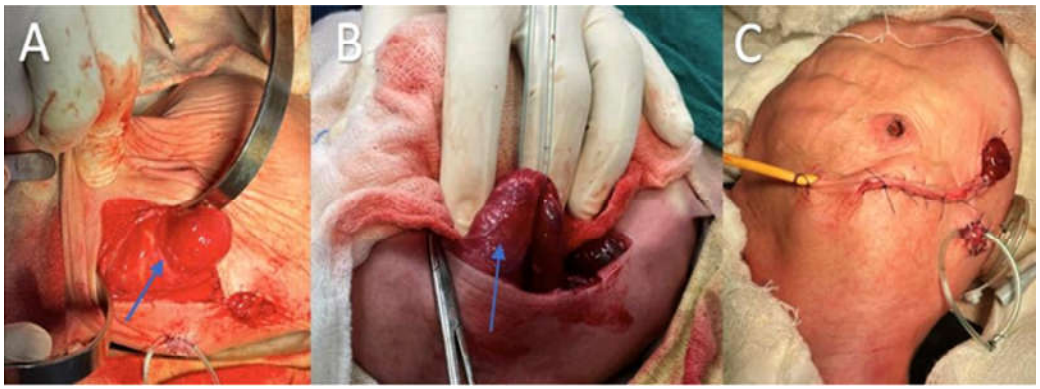

Fig. 4: Showing (A)Enlarged and distended bladder with diverticulum, (B) Massively dilated ureter, (C) End descending colostomy, ureterostomy and suprapubic cystostomy.

creatine came down to 0.9 mg/dl on serial kidney function test reports with adequate urine output. Stoma got functional on third post-operative day. Initially broad spectrum antibiotics were started. Later, post-operative blood culture grew Acinetobacter and urine showed budding yeast cells. Antibiotics were adjusted in accordance with sensitivity pattern along with anti-fungal drugs (Meropenem, Vancomycin and Amphotericin B). Baby developed full blown sepsis and succumbed on eighteenth post-operative day.

DISCUSSION

Prune belly syndrome (PBS) is also known as Eagle-Barrett syndrome and characterized by the classical triad of urinary tract anomalies, deficient abdominal musculature, and bilateral cryptorchidism. PBS has been associated with variety of congenital anomaliesincluding cardiopulmonary, gastroin testinal, musculoskeletal and respiratory abnormalities.[3,4] Gastrointestinal malformations such as mesenteric malrotation, atresia, stenosis, volvulus, anorectal malformation, splenic torsion, hirschsprung disease and gastroschisis are knownand seen in 30% of these patients.[4,5] Genitourinary anomalies areseen in 24% of patients thatinclude renal dysplasia hypoplasia, bilateral hydronephrosis, bilateral hydroureter, vesico ureteric reflux, megacystis, megalourethra, hypospadias, undescended testes and VACTERL anomalies are known.[4] Cardiopulmonary,

gastrointestinal andmusculoskeletal anomalies constitute 75% of associated anomalies.

Congenital pouch colon is arare gastrointestinal association with PBS and has been reported in only few instances before. CPC is also known as congenital short colon,a rare variant of ARM, and it is distinctly different from other ARMs in which a varying length of colon is replaced by a dilated pouch thatinvariably has a wide fistulous communication with the genitourinary tract. The classification proposed by Narasimharao et al is based on the length of normal colon proximal to the colonic pouch.[7] In type 1, the ileum opens directly into a pouch; in type 2, the ileum opens into a short segment of the cecum, which then opens into a pouch; and in type 3, at least 10 to 15 cm of normal colon is present between the ileum and the pouch, in type 4, only the terminal portion of the colon (sigmoid or rectum) is converted into a pouch. CPC cases are exclusively found in Southeast Asia, particularly in India.

PBS association with CPC is extremely rare and only five reports have been documented in literature. [Table I]

Table I: Review of literature showing PBS with associated anomalies.

Studies	PBS with Type of Pouch Colon	Associated Anomalies
Bangroo et al. (8)	PBS + Type I CPC	Anterior Urethral Diverticulum
Baba et al. (9)	PBS + Type IV CPC	Microurethra + absent dermatome
Raghavan et al (5)	PBS + Type I CPC	Penoscrotal Hypospadias
Garge et al. (10)	PBS + Type IV CPC	Scaphoid Megalourethra + Cardiac defects (Coarctation of aorta, patent ductus arteriosus, atrial septal defects)
Annigeri et al. (11)	PBS + Type IV CPC	Bilateral Hydronephrosis with massively dilated & tortuous ureters
This Study	PBS + Type IV CPC	Scaphoid Megalourethra + bilateral Hydronephrosis with massively dilated & tortuous ureters

Antenatally PBS is associated with prostatic hypoplasia, some patients have a urachal diverticulum or megalourethra; a large, thick-walled bladder; tortuous and dilated ureters. Varying amounts of hydronephrosis and varying degrees of renal dysplasia are seen. Perinatal mortality rates are high, ranging from 10 to 25%, with early death primarily attributed to the degree of prematurity, Oligohydramnios and pulmonary hypoplasia.[12] When PBS is associated with CPC it may further jeopardise the prognosis and aggravate the severity, as the pouch in the abdomen can cause physical obstruction that adds to functional obstruction in PBS.

In view of massively dilated and tortuous ureters child may need a supravesical diversion (ureterostomies), cutaneous vesicostomy and later reduction cystoplasty, ureteral reconstruction, and reconstruction of anterior abdominal wall.Anterior urethral reconstruction may also be required in the setting of megalourethra.

CONCLUSION

We can conclude that PBS is an uncommon entity and its association with CPC is extremely rare. This rare association also has poor prognosis. Multifaceted approach is required due to the association with multiple anomalies. Proper pre and postnatal assessment, manoeuvring of surgical procedures, counselling and postoperative care are important for the management of this rare association.

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Reports of randomized clinical trials should be based on the CONSORT Statement (http:// www. consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma. net/e/policy/l 7-c_e.html).

Results

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

Discussion

Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

References

List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_ requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540–7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347–55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone-iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3–9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792–801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O,

Kidd EAM, editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. pp 7–27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979–2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7–18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

More information about other reference types is available at www.nlm.nih.gov/bsd/uniform_requirements.html, but observes some minor deviations (no full stop after journal title, no issue or date after volume, etc.).

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Tables should be self-explanatory and should not duplicate textual material.

Tables with more than 10 columns and 25 rows are not acceptable.

Table numbers should be in Arabic numerals, consecutively in the order of their first citation in the text and supply a brief title for each.

Explain in footnotes all non-standard abbreviations that are used in each table.

For footnotes use the following symbols, in this sequence: *, ¶, †, ‡‡,

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Graphics files are welcome if supplied as Tiff, EPS, or PowerPoint files of minimum 1200x1600 pixel size. The minimum line weight for line art is 0.5 point for optimal printing.

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Type or print out legends (maximum 40 words, excluding the credit line) for illustrations using double spacing, with Arabic numerals corresponding to the illustrations.

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Standard abbreviations should be used and be spelt out when first used in the text. Abbreviations should not be used in the title or abstract.

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- Conflicts of interest disclosed

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- Middle name initials provided.
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- References according to the journal's instructions

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- Table and figure numbers in Arabic letters (not Roman).
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