NEWBORN PHYSIOLOGY AND THE PRINCIPLES OF NEONATAL

NEWBORN PHYSIOLOGY AND THE PRINCIPLES OF NEONATAL SURGERY

Neonatal physiology can pose challenges when there is a surgi - cal condition (Table 18.2) . Perioperatively , a newborn needing - ventilation is best managed in a surgical unit co-located with a medical neonatal intensive care unit (NICU). Some babies are transferred many miles between units. If a neonatal surgical transfer team is not available, accompanying clinicians should be reminded that neonates with bowel obstruction need a nasogastric tube to decompress the stomach; this should be left on free drainage and regularly aspirated. Neonates, especially the premature, lose heat and fluid rap - idly , have poor nutritional reserves, are susceptible to infection h eart and have an immature blood-brain barrier. Surgery should be e ffi ciently performed in a warm environment with gentle tissue handling and broad-spectrum antibiotic cov er. The liver can - be fragile, and blood should be available for laparotomies. Sick babies with NEC or an acute volvulus may be best operated - upon at the cot side in a NICU. In an unstable infant with an acute abdomen, damage control principles should be applied with a second-look laparotomy and definitive repair following stabilisation. Electrocautery is delivered on the lowest working setting. Avoid the Trendelenburg position in the preterm when placing a diathermy pad as elevation risks intraventricular haemorrhages. A laparotomy may be performed through a right-sided transverse muscle-cutting incision just above the umbilicus, taking care to avoid the large, fragile liver, or through a mid - line longitudinal incision, avoiding the bladder, which rises into the abdomen. A muscle-sparing symmetrical supraumbilical - incision or an omega incision are options with the recti pulled laterally . A left-sided diaphragmatic hernia can be approached through a subcostal incision. The umbilical vein remains patent for many days and is divided between ligatures if the midline is crossed. Gastrointestinal surgery may involve bowel resection with a single layer interrupted or continuously sutured anas tomosis or formation of a temporary spouted enterostomy . In stable, well babies, laparoscopy is suitable for some procedures (e.g. duodenal atresia repair , malrotation without acute volvu lus, excision of large ovarian cysts). Central venous access is needed for parenteral nutrition (PN) if enteral feeds are likely to be delayed. Harald Hirschsprung , 1830–1916, fi rst Danish paediatrician, considered Hirschsprung’s disease to be developmental.

Associations illustrating the need for screening Primary abnormality Incidence/ 100 /uni00A0 000 live births Oesophageal atresia/ 24 VACTERL, CHARGE, aneuploidy/other gene defects, duodenal atresia, anorectal tracheoesophageal /f_i stula malformations, tracheomalacia, gastroesophageal re /f_l ux Duodenal atresia 13 Trisomy 21, other intestinal atresias, oesophageal

atresia/tracheoesophageal /f_i stula, intestinal malrotation Intestinal atresias 10 Cystic /f_i brosis, other atresias Anorectal malformations 26 Oesophageal atresia/tracheoesophageal /f_i stula, VACTERL, Trisomy 21 Hirschsprung’s disease 14 Trisomy 21, other chromosomal defects, familial Structural anomalies atresias/anorectal malformations Syndromic hypoventilation syndrome (Ondine’s curse) Biliary atresia 3 Biliary atresia splenic malformation (BASM) syndrome: polysplenia, vascular and cardiac anomalies, defects of situs Cytomegalovirus Gastroschisis 20 Intestinal atresias, undescended testes Exomphalos (major and minor) 12 Aneuploidy, chromosomal anomalies, cardiac defects, Beckwith–Wiedemann syndrome Congenital diaphragmatic hernia 20 Aneuploidy, chromosomal anomalies, CHARGE, malrotation. Syndromic Congenital pulmonary airway 10 Vertebral/chest wall deformities, intestinal duplications, cardiac anomalies, congenital malformations (CPAM) diaphragmatic hernia CHARGE, c oloboma, h eart defects, choanal a tresia, growth r etardation, c ardiac, t racheoesophageal, r enal and l imb anomalies. Type A Type B Type C : Cardiac, craniofacial, cleft palate, polydactyly, intestinal : Multiple endocrine neoplasia, Waardenburg–Shah syndrome, congenital g enital anomalies and e ar anomalies; VACTERL, v ertebral, a norectal,

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