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EMERGENCY TIPS

J.S. Surpure

Doppler Ultrasonography in Torsion of the Testes

Urgent treatment for torsion of the testes is necessary if the testes are to be preserved. The inaccuracy of clinical diagnosis is now well recognized, but an aggressive surgical approach has resulted in an 18-65% unnecessary operation rate. What is the value of Doppler ultrasonography in the diagnosis of testicular torsion? Bickerstaff *et al.* (1) report the use of Doppler ultrasonography in 41 patients who underwent an emergency exploration of the scrotum because of suspected testicular torsion.

The final operative diagnoses were testicular torsion in 18 patients, epididymitis in 15 patients, and torsion of a testicular appendage in 8 patients. The sensitivity and specificity of the test for the diagnosis of testicular torsion were 67 and 83% respectively, and the predictive value of either a positive or negative result was 100. The precise technique of the Doppler examination is of critical importance if misdiagnosis is to be avoided. Most of the reported cases of misdiagnosis can probably be attributed to faulty technique. Testicular torsion can be diagnosed incorrectly as epididymitis if a pulsatile signal, originating from either the inflamed scrotal skin or the testicular artery proximal to the torsion is

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mistakenly interpreted as arising from the testis. These errors can be avoided by applying a funicular compression test and by pointing the transducer towards the lower pole of the testis. The main limitation of the investigation is that in the absence of testicular ischemia, a diagnosis cannot be made. Of particular importance is the inability of the Doppler examination to distinguish between epididymitis and conditions which would require operative treatment such as torsion of a testicular appendage or a testicular torsion which has undergone spontaneous reduction. Another limitation of the technique is that the presence or absence of a testicular torsion can only be diagnosed unequivocally in 76% of patients. Furthermore, a satisfactory examination cannot always be performed on young boys, and equivocal result is sometimes obtained from long standing testicular torsions or severe epididymitis.

The authors suggest that all patients who are strongly suspected of having a testicular torsion should undergo an urgent scrotal exploration. The Doppler examination is probably of greatest value in the management of patients who are thought not to have a testicular torsion, but in whom the condition cannot be excluded with competence on clinical grounds. The Doppler examination will demonstrate the absence of testicular ischemia in many of these patients, and unnecessary operations can be avoided. The authors found that the Doppler examination is rapid, simple, easy to learn, inexpensive, and does not delay treatment.

Extracorporeal Rewarming in Submersion Injury

Submersion injury represents a significant cause of morbidity and mortality in

the pediatric and young adult population. Previous reports have noted neurologically intact survival after cold-water submersions of up to 45 minutes. Bolte *et al.*(2) report a good neurologic outcome in a 2½ year old child submerged in cold water for at least 66 minutes.

The child fell into a creek, after which the mother searched in vain for between 4 and 10 minutes. Emergency personnel arrived within 8 minutes of the call. They removed the child from the water 62 minutes after they received the initial call. The child was cyanotic, apneic, flaccid, and had fixed and dilated pupils with no palpable pulse. A cardiac monitor revealed asystole. Cardiopulmonary resuscitation was begun. The child's rectal temperature in the emergency department was 22.4°C. Core rewarming was begun with warmed (40°C) humidified oxygen via an endotracheal tube, warmed (40°C) isotonic intravenous fluids, and continuous 40°C gastric lavage. The child was transferred to the operating room, where rectal and nasal pharyngeal temperatures were 19°C. Extracorporeal rewarming (ECR) was then initiated approximately 3 hours after initial rescue of the child. When the nasal pharyngeal temperature reached 25°C, a spontaneous gasp and fine ventricular fibrillation were noted. A few minutes later, the patient spontaneously opened her eyes, and her pupils became reactive. The rhythm changed to coarse ventricular fibrillation, which converted spontaneously to normal sinus rhythm. ECR was discontinued when the core temperature reached 37°C (total bypass time, 53 min). Postoperatively, phenobarbital was given for seizure prophylaxis. At a later stage, severe noncardiogenic pulmonary edema developed, necessitating mechanical ventilation for 6 days.

The child's neurologic course showed gradual but steady improvement. She cried spontaneously 7 days after admission. She was using 4-word phrases by 4 weeks. Apparent cortical blindness resolved after 7 weeks. At her discharge more than 8 weeks of hospitalization, her language and fine motor skills were appropriate for age, but a tremor interfered with these skills. Twelve months after her submersion, the child was functioning at her age level, and her tremor was showing progressive improvement.

This case emphasizes the importance of aggressive resuscitation and rewarming even after prolonged submersion in patients with marked hypothermia. The advantages of ECR over other core rewarming techniques include the reinstatement of perfusion regardless of the cardiac rhythm, reduction of the high blood viscosity associated with severe hypothermia, and rapid restoration of normal thermia. The disadvantages of ECR include the lack of general availability and the risks of heparinization. The presence of intraabdominal, or intrathoracic bleeding is a contraindication to the use of ECR in patients who have sustained concomitant trauma. Pulmonary edema has been reported after rewarming in severely hypothermic patients both with and without ECR. This child was deeply hypothermic at 19°C, which represents the lowest reported temperature recorded in a submersion victim who achieved intact neurologic survival. Furthermore, the submersion time in cold water of at least 66 min is the longest time ever reported.

Caustic Complications

Accidental ingestion of caustic agents is potentially capable of burning the esophagus

which can lead to stricture formation. What is the best approach to prevent these strictures? Many clinicians administer corticosteroids and antibiotics to all children with established esophageal burns and claim good results. What is the role of nasogastric tube as an intraluminal esophageal stent? Wijburg *et al.*(3) discuss their experience. The records of 132 children under 19 years of age (mean age 2 years) were included in the study. After examination of the mouth, pharynx and larynx, and esophagoscopy was performed in all patients within 24 hours after ingestion. When the burns were noted as circular and deep a silicone nasogastric tube was immediately inserted. The tube remained *in situ* for 5-6 weeks. After removal of the tube, a control esophagoscopy was performed and/or a barium swallow examination was done. None of the patients received corticosteroids. Forty-nine children had burns in the esophagus, 11 of whom had deep and circular (severe) burns. Only these 11 children were treated with a special nasogastric tube (an intraluminal stent); this was their sole treatment. Only one of the 11 developed mild stenosis. In none of the other untreated children stricture formation was observed.

The authors conclude that selective nasogastric tube effectively prevents stricture formation and that there is no indication for the use of corticosteroids in the treatment of caustic esophageal lesions in children. This selective approach appears to spare many children from unnecessary treatment and hospitalization; however, more controlled clinical studies are needed to approve their selective regimen.

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THE ROYAL NORTH SHORE HOSPITAL, SYDNEY (AUSTRALIA)

Applications for Neonatal Registrar

The Royal North Shore Hospital in Sydney, Australia has approximately 3000 deliveries per annum and ventilates 120 babies a year. It is a level III Newborn Intensive Care Unit.

Applications are invited for one paid position of Neonatal Registrar. The appointment in the first instance is for 12 months and commences in January 1992. The minimum requirement is MBBS (with preferably MD in Pediatrics) and minimum of six months experience in Newborn Intensive Care.

Please address applications to Dr. John Arnold, Director of Neonatology, Newborn Intensive Care Unit, Royal North Shore Hospital, St Leonards NSW 2065, Australia.

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