ORIGINAL ARTICLE

Management of Gastroschisis in a Peripheral Hospital Setting

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Summary

Ten patients (5 males and 5 females) with gastroschisis were treated in Alor Setar Hospital from January 1989 to December 1993. Two patients had associated congenital anomalies. Primary closure was possible in 9 patient while the other patient had stage closure. All patients received prophylactic antibiotics, 9 patients were ventilated electively in the post-operative period and 7 patients received parenteral nutrition. There were 9 survivors. Complications especially wound infection and breakdown were seen in 7 patients. The average hospital stay was 36 days.

Key Words: Gastroschisis, Neonatal surgery, Congenital abnormality

Introduction

Gastroschisis is defined as a congenital defect of the periumbilical body wall through which abdominal contents protrude[1]. The first surgical repair of gastroschisis was reported by Watkins in 1943[2]. The survival rate has improved from 41% to 62% in the 1950s and 1960s[3] to over 90% in the 1990s[4,5] with improvements in surgical treatment, aggressive parental nutritional support and ventilatory support. In this paper, gastroschisis and its management in a peripheral hospital setting is presented.

Materials and Methods

There were 10 neonates treated for gastroschisis in Alor Setar Hospital from January 1989 to December 1993. The case records of these patients were traced and analysed with regard to associated congenital anomalies, the methods of closure of the abdominal wall defect, postoperative ventilation, parental nutrition, complications, length of hospital stay and survival.

Results

There were 5 male and 5 female patients. Primary closure of the abdominal wall defect was achieved in 9 patients. Of these, 5 had primary fascial closure while the other 4 had their defects closed using lyophilised dura (inner layer) and polypropylene mesh (outer layer) with overlying primary skin closure. The other neonate had staged repair using a sterile plastic urine bag as a silo in the initial procedure. The protruded intestine was then reduced gradually for 10 days until complete fascial closure become possible. All patients had their initial operations on the first day of life except one who had it on the second day.

There were 2 patients with associated anomalies; one had unilateral maldescended testes and the other had midgut malrotation.

There were 9 survivors. One patient died of septicaemia on the fifteenth day of life. Complications were seen in 7 patients. Of the 5 patients who had primary fascial closure, 3 developed complications (2 wound sepsis and 1 bowel ischaemia). All 4 patients who had primary closure using prosthetic materials developed complications (4 wound sepsis, 1 bowel ischaemia) and one of these patients died as a result. The patient with staged closure did not have any complications. Five

patients needed 2 operations and 1 patient needed 3 operations under general anaesthesia.

The requirement for postoperative ventilation and parental nutrition and their duration as well as the length of hospital stay are shown in Table I.

Discussion

The diagnosis of gastroschisis is straightforward from the clinical appearance. However the operative management of gastroschisis is often difficult because the underdeveloped abdominal cavity is unable to accommodate the edematous loops of intestine. The aim of treatment is primary fascial and skin closure of the abdominal wall defect[4,5]. If this is not possible, then temporary coverage of the defect is necessary and various methods have been described.

Unlike exomphalos, gastroschisis is usually not associated with other congenital anomalies[3]. Even when present, these anomalies are usually not life-threatening and therefore they do not significantly affect the prognosis[4]. In our series of 10 patients, only 2 had associated anomalies that did not affect the outcome.

The prognosis of neonates born with gastroschisis has improved markedly since the 1960's. This improvement in prognosis has been attributed to many factors, the most important being in preoperative care, methods of closure and the provision of postoperative ventilation and parenteral nutrition. We have recorded 9 survivors out of 10 patients managed with the availability of the above facilities.

Primary closure if possible should always be the aim. However, forceful reduction of the intestine and primary closure may result in raised intraabdominal pressure with consequent vascular compression and diaphragmatic splinting. This will result in a reduction in venous return and therefore cardiac output, bowel ischaemia, renal failure and lower limb edema.

Diaphragmatic splinting will cause respiratory failure. We were able to achieve primary closure in 9 patients, 4 of whom required prosthetic material for support. There were 2 patients with bowel ischaemia that needed resectional surgery. Nine of our patients required ventilatory support.

Despite prophylactic antibiotics (penicillin, gentamicin and metronidazole), septic complications were seen in 6 patients resulting in 1 death in our series of patients. Wound infection is frequently attributed to the use of non-biodegradable prosthetic material[6], as was seen in all 4 of our patients. Therefore, biodegradable materials have been tried, including lyophilized dura and polyglactin mesh. In our hospital, when necessary, lyophilized dura was used as the inner layer and reinforced with polypropylene mesh.

The return of bowel function in patients with gastroschisis following operative reduction is delayed because the intestine is inflamed and shortened following prolonged intrauterine contact with amniotic fluid[8]. Therefore most of these neonates require parenteral nutrition in the postoperative period. The average duration of parenteral nutrition was 9 days in

Table I
Requirement for post op. ventilation, parenteral nutrition and length of hospital stay

Type of Patients	No. of Patients	Duration of Hospital stay (range) in days
Requirement for postop. ventilation	9	5 (1 - 9)
Requirement for parental nutrition	7	9 (3 - 18)
Requirement for hospital stay	10	36 (12 - 60)

our patients. This slow return of bowel function and the management of septic complication were the main reasons for the prolonged hospital stay observed (average of 36 days) in our patients.

In summary, the management of patients with gastroschisis remains a challenge especially the closure of the abdominal wall defect with the minimal of complications. The prognosis of these patients has improved markedly with the aggressive use of ventilatory support and parenteral nutrition. Although the complication rate was high, we had observed an encouraging survival rate for patients with gastroschisis managed in a peripheral setting in Alor Setar Hospital.

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