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Use of Surgical Gloves for Covering in the Treatment of Gastroschisis

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A primary fascial closure is undoubtedly the best method for treatment of gastroschisis (GS). When the size of abdominal cavity is insufficient to contain the herniated viscera, a silo is needed. In emergency cases, application of such a silo depends on availability of prosthetic material, the medical facilities, and experience of the surgeon^[1].

Recently some centers have experienced ward reduction without anesthesia and intubation which has not proved to be more beneficial than traditional surgical repair^[2]. In our area due to unavailability of silastic silo or silicone we came to the idea of using surgical gloves as silo.

Nine newborn infants with GS were diagnosed after birth between 2003 and 2007 (six girls and three boys) (Fig 1) with a mean gestational age of 36.4 weeks (range 32-38 weeks).



Fig 1: Gastroschisis with evisceration of edematous, thickened intestinal loops

Two were born with cesarean section and seven with normal vaginal delivery. Birth weights ranged from 1700 to 3260gr (mean: 2130gr). Seven had only intestine and large bowel herniation, two had also stomach herniation through anterior abdominal fissure measuring 4-6 cm. No associated anomalies were found. Treatment started immediately after birth by stabilizing the infant and wrapping the herniated bowel with moistened sterile compresses in order to maintain body temperature and prevent contamination and water loss from the exposed bowel. A nasogastric tube (NGT) was inserted for aspiration of GI secretions.

Intravenous fluids and antibiotics (Ampicillin and Gentamicin) were administered. None of the neonates needed intubation before surgery but all of them were intubated post-operatively and were connected to ventilator for 2-6 days. The newborns were operated upon at 2 to 12 hours of life under general anesthesia except one who was operated at 24 hours of life due to late transmission to hospital. Surgery started by inserting a nasogastric tube and urinary catheter. After general anesthesia the bowels were irrigated with tepid saline. The possible presence of intestinal atresias and

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perforations was checked. NGT was conducted to the duodenum and fixed. Then with infusion of tepid saline into the NGT and squeezing the loops meconium was evacuated through anus. It was preferred to perform anal dilation before starting surgery. Then the abdominal defect was expanded by 2 cm cranially and caudally to facilitate reduction of the viscera into the abdominal cavity. Primary closure of the abdominal wall was not possible and all patients underwent staged reduction due to the disproportion between the volume of exposed viscera and the size of abdominal cavity. In this special method we used three layer latex coverage that was made by three surgical gloves no. 8 to produce a silo for herniated bowels. Thicker edges of the produced silo were fixed to margins of the defect by continuous 3.0 nylon sutures. Upper part of the silo was first twisted and then hanged to the ceiling of the incubator by a nylon suture (Fig 2). The outer portion of the latex silo was daily covered by tetracycline 3% ointment and the skin of the abdomen and suture line by mupiricin ointment. During daily dressing, the upper part of the silo was twisted 360 degrees, sutured and hanged again so that the contents of the silo were progressively compressed into the abdominal cavity (Fig 3).



Fig 2: Three layer latex silo fixed to the edge of the defect and hanged from ceiling of the incubator



Fig 3: The contents of the silo are progressively compressed into the abdominal cavity

Each layer of latex was removed maximally every five days. Thus, at most on 15th day we removed the last layer and after enterolysis the patients underwent the second surgical step which consisted of repairing the abdominal defect (Fig 4). It should be mentioned that if possible, the silo was removed earlier, so that we removed the silos between 4 to 15 days of life (mean: 9.5 days).



Fig 4: Second surgical step consisted of repairing the abdominal defect

Patients were intubated after surgery for 2-6 days. The newborn with the lowest birthweight, the first case in our patients, died on 30th day of life due to sepsis. The other eight patients were discharged 9 to 26 days after admission.

Oral feeding by gavage was possible in all patients by 8 days after second surgery (at 15th-23rd day of life). Lower limb edema in 5 and scrotal edema in two patients occurred and were managed with supportive care.

None of our patients needed a third operation. One of our patients was readmitted about 3 months later with bilious vomiting. The case improved after 24 hours of admission and was discharged. All of our patients are being followed at pediatric surgery clinic for more than two years. At present, they do not have incisional hernias or other surgical complications, show adequate growth and development for age. The survival rate was 88.8%.

Schuster was the first to introduce staged closure of gastroschisis by prosthetic materials [3]. Later, several types of materials were utilized as temporary silo, including polyvinyl chloride (PVC) bag for blood-derivative transfer, an opened-out tissue expander, silicone, and a PTFE (polytetrafluoroethylene) patch (Table 1)[1,4].

Mortality in recent case series is around 10% and mostly due to septicemia. In other words, by use of three layer latex, dehiscence in the suture line is minimal due to renewing the outer layer every 3-5 days mostly before the time expected to develop dehiscence or infection.

In conclusion we suppose that, in comparison with other methods, the most important characteristics of our method to be total enteral washing with tepid saline and

using three layer latex as silo because of being renewable, flexible, smooth, inexpensive and available.

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Table 1: Comparison between surgical gloves method, PVC bag and preformed bedside silo

| | First oral feeding (day) | No. of patients that needed third surgery | Days on intubation |
|------------------------|--|---|--------------------|
| PVC bag | 23 rd -39 th day of life | Five out of seven | 5-14 |
| Preformed bedside Silo | 5-34 th day of life | One out of twenty one | 0-19 |
| Surgical gloves | 15-23 rd day of life | None | 2-6 |