GASTROSCHISIS MANAGEMENT WITH COLOSTOMY BAG. AN EARLY EXPERIENCE AND FUTURE PROSPECTS IN A DEVELOPING COUNTRY

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ABSTRACT:

Objective: To determine the short term outcome of gastroschisis management by using colostomy bag and delayed primary repair approach.

Materials and Methods: This prospective descriptive study was conducted in the department of pediatric surgery Postgraduate Medical institute Lady reading Hospital Peshawar from January 2010 to January 2012. A total of fifteen babies with gastroschisis were admitted to the pediatric surgical unit Lady Reading hospital Peshawar after inclusion and exclusion criteria. After initial intravenous line placement, resuscitation, nasogastric suction, intravenous vitamin k and triple regimen antibiotics. Heat and water loss from exposed viscera were controlled by placing the lower trunk and intestine in a plastic bag until commencement of placement of colostomy bag under general anesthesia .A transparent colostomy bag were applied under general aneasthesia, by suturing with silk suture to the anterior abdominal wall defect. Technique of gravitational and manual reduction of the gut done daily by tying around the colostomy bag, and on 3rd post operative day under general aneasthesia by stretching of the anterior abdominal wall along with partial closure by opsite dressing application and on 7th post operative day complete abdominal wall closure by abdominal wall stretching and enmasse closure of the defect by applying tension suture. Post operatively all these patients were managed in the general ward because of lack pediatric intensive care unit and pediatric ventilator facility. Survived Patients were followed in outpatient department on monthly basis, up to one year of age for any complication.

Results: A total of 15 infants were managed using this method. Out of these 15 patients, 9 were male babies (60%) and 6 were female (40%). Ages of the babies at presentation were from 2 hours to 5 days, mean age was 23.86 $\pm$ 7.663 hours. The outcome parameters were survival rate, time to establish full oral feeding, case fatality, wound infection, abdominal compartment syndrome, total hospital stay, and incisional hernia. There were 8(53.3%) survivors, mortality were 7(46.6%), time to establish full oral feeding was ranging from 5 to 14 days. Mean hospital stay was 12.00 $\pm$ 4.11 days.

Conclusion: Gastroschisis is a rare but complex abdominal wall defect. Surgical management using colostomy bag with delayed primary repair is an effective treatment and cost effective method in gastroschisis management in a set up lacking the facility of neonatal intensive care unit, pediatric ventilators and availabilliy and affordibillty of silo bags.

Key Words: Gastroschisis, Stoma Bag, Outcome.

INTRODUCTION

Gastroschisis (GS) is a congenital abdominal wall defect, typically located to the right of the umbilicus with herniation of the midgut. It was first described by Calder in 1733[1]. The reported incidence of Gastroschisis is about 1 in 3000 to 1 in 10,000 live births, but studies shows that the incidence is increasing[1,2]. Gastroschisis is rarely associated with other anomalies, but the major morbidity and mortality are related to intestinal damage due to prolonged exposure of gut to amniotic fluid during fetal life resulting in dysfunction of the mucosa and poor motility of the gut[3]. The management of gastroschisis has gradually evolved and improved over the years and there is no consensus which approach is ideal[4]. However the principles of management remain the same. First, to reduce the viscera safely, second, to close the abdominal wall defect with an acceptable cosmetic appearance and, third, proper nutritional support, in addition to detection and proper management of any associated anomalies or complications[2,5]. The main surgical option is whether to perform a primary closure under general anesthesia after forcible stretching of the ab-

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dominal wall soon after birth[6], or performing staged reduction using a temporary surgically placed prosthetic silo followed by closure[7]. Bed side reduction (ward reduction) in neonatal intensive care unit without general anesthesia and non-operative placement of spring loaded silo for gradual reduction followed by delayed closure of abdominal wall under general anesthesia are other options recommended[8,9]. The degree of the viscero-abdominal disproportion and the condition of the herniated viscera plays an important role in making the surgical decision. For institutions which are highly resource limited with non availability of neonatal or pediatric intensive care unit and non affordability of patients to use silo in their management, also having bitter experience with primary closure of gastroschisis, we had an idea to use colostomy bag in place of silo and assess its outcome.

MATERIAL AND METHODS

This prospective descriptive study was conducted in the Department of Pediatric Surgery Post Graduate Medical Institute Lady Reading Hospital, Peshawar from January 2010 to January 2012.

All these patients were admitted through the emergency department of the hospital. Preterm neonates gestational age less than 30 weeks were not included as in our setup these preterm mortality is much high irrespective of presence or absence of any surgical anomaly. Similarly patients with ruptured omphalocele, primary surgery in other centre were excluded from the study. Total 15 patients were included in the study, 09 were male and 06 were female. In all patients intravenous line was maintained, nasogastric tube passed for suction, intravenous fluids, dextrose and antibiotics were started. A dose of vitamin K was also given to prevent hemorrhagic disease of newborn. All patients after stabilized underwent staged closure using colostomy bag with the first intervention within 24 hours of admission. These patients were shifted to ward due to non availability of highy dependency unit and intensive care unit facility and postoperative care and daily assessment were done there. Successive stages of closure was done on 3rd to 7th day of intervention and continued till successful closure of the abdominal wall defect. Times of intervention and stay in hospital depended on size of defect, success of early closure and clinical condition of the patient. Patients were followed for 6 months.

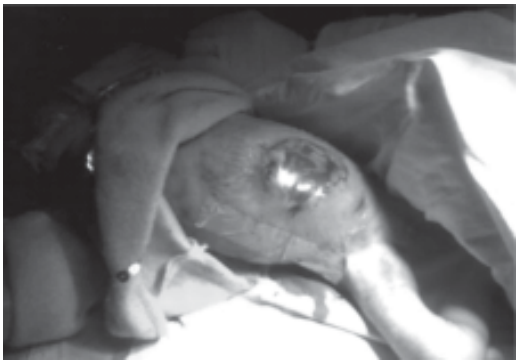
RESULTS

15 patients met our criteria for this study in management of gastroschesis using colostomy bag. Table 1 shows different characteristics of the study. Out of these 9 were male and 6 were female. All were managed with staged closure using colostomy bag. In 9 of them closure was possible in two stages with the first in the first 24 hours of admission and 2nd on 3rd to 4th day of admission. While 6 patients required 3 sessions. In 6 patients feeding was started in 1st 6 days, in 4 in 7 to 10 days and in 2 patients after 10 days. Complications noted were commonly sepsis 9 (55%), wound infection 4 (26%), Incisional hernia no patient. Of 9 who developed sepsis only 2 survived and of those with wound infection none survived. Overall mortality was 7(46.6%).

Table 1:

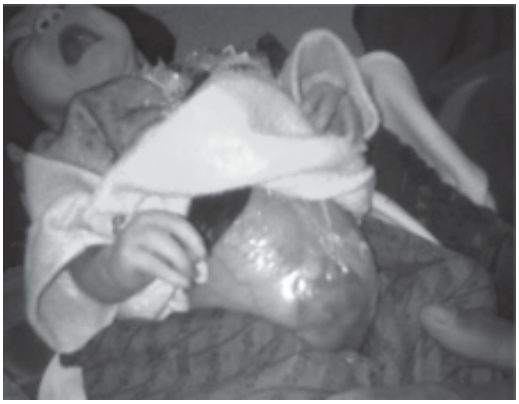
Characteristic	Frequency	Survival
Gestational age		
<36 weeks	4	2 (50%)
Term baby	11	6 (54.5%)
Birth Weight		
1.5-2.4kg	3	
2.5-4.8kg	12	7 (58.3%)
Day of presentation		
< 12 hours	8	5 (62.5%)
12-48 hours	4	2 (50%)
>48 hours	3	1 (33.3%)
Apgar score		
<8	3	1 (33.3%)
8-10	12	7(58.3%)
Number of sessions		
2	9	5 (55.5%)
3	6	3 (50%)
Feeding day		
4 -6 days	5	4 (66.6%)
7-10 days	4	3 (75%)
>10 days	2	1 (50%)
Expired before feeding	3	—
Sepsis	9	2 (22.2%)
Wound infection	4	00
Abdominal compar-	00	00
tment syndrome		
Incisional hernia	00	00
Hospital stay		
<7 days	5	2 (40%)
7-14 days	8	5 (62.5%)
>14 days	1 (50%)	
Mortality	7 (46.6%)	8 (53.3%)

1 -Initial colostomy bag application



2-Partial Closure on Day 3rd in OT

3-complete abdominal wall closure by enmasse tension suture



4-same pt after one month in OPD

5-same pt after 3 months in opd

DISCUSSION

The incidence of gastroschisis is increasing worldwide and in the last three decades there has been a steady increase in the prevalence of gastroschisis. The present prevalence of gastroschisis in the British Isles for all maternal ages is 4.0 per 10,000 live births. However more worryingly is the unexplained increase in incidence of gastroschisis in the last 10 years from 8.9 to 24.4 per 10,000 live births to mothers younger than 20 years of age[10]. Measures have been tried to detect this congenital abnormality earlier, assess progression by serial ultrasounds, plan for best time of delivery and perinatal management and type of intervention for better outcome. Despite all these measures decreasing the mortality in newborn with gastroshsis, it is associated with a high occurrence of morbidity, especially infections, intestinal dysfunction and adhesions.[4,5,6]

Prenatal diagnosis and care, surgical management and neonatal intensive care have indisputably improved during the last thirty years; nevertheless, this disease still has high short- and long-term morbidity as well as high hospital costs[11]. similarly prenatal diagnosis and care has made it possible to plan for better management, however there is still controversy over ideal gestational age of delivery of babies with gastroschsis.[4] It has been suggested that preterm delivery together with cesarean section could improve the outcome. This phenomenon was attributed to limiting the exposure of the bowel to amniotic fluid and its harmful effects and was further supported by other authors;[12] however, other studies have not supported this hypothesis, including a prospective trial.[13,14] Schmidt AF et al in his study noted that newborns in whom primary closure was feasible had a significantly lower gestational age compared with the newborns who needed staged closure (35:1.9 vs. 37:1.7)[4]. Future studies may help to clarify the impact of early delivery on the management and evolution of newborns with gastroschisis.[4,12,15,16]

The management of neonates with gastroschisis depends on several factors including the amount

and status of herniated bowel, the size of abdominal cavity, the available resources at neonatal intestine care unit, and the presence or absence of other associated congenital anomalies. Operative primary reduction with closure of the abdominal defect continued to be the standard initial surgical strategy, whereas operative staged reduction is frequently used as a rescue strategy when reduction is deemed unsafe or physically impossible because of visceroabdominal disproportion[17]. However yet there is no consensus about the procedure choice. Some authors consider Primary closure of the abdominal wall as the ideal correction of gastroschisis[18]. Historically, staged closure has been reported to be associated with increased risk of complications, especially sepsis, however, delayed closure has also resulted in better outcomes, including fewer days on mechanical ventilation, decreased length of hospital stay, decreased time to full feeding and, consequently, reduced morbidities and associated costs[19,20]. In our set up since long primary closure was the routine procedure in the management of gastroschisis; it had significant morbidity and mortality. Though no local clinical audit or study has been published regarding it, our experience with management of gastroschisis was very bitter from our past experience of primary closure and almost only 5% survival was possible. That is why we tried to use staged closure with the help of colostomy bag which could be possible for our economically poor community.

In developing countries the mortality from gastroschisis has been reported to be very high, reaching 50%.[4,21] P C Vilela et al noted overall mortality of gastroschisis 52% and sepsis was the most common cause of this high mortality, 93.8%. He also noted that prenatal diagnosis and proper management in time can reduce the risk of death by 70%.[13] We noted 46.6% mortality in our study and in all sepsis was the cause of death, prenatal diagnosis was made only in 4 patients, these were shifted to pediatric surgery ER soon after birth and for earlier management. Similarly in Africa Sekabira and Hadley noted overall mortality of 43% in the management of gastroschisis, however, his study was in favor of primary closure.[14] We couldn't find any local published study to compare our results with primary or staged closure in management of gastroschisis.

CONCLUSION

Our experience with management of gastroschisis with using colostomy bag is quite good as compared to the primary closure we used in the past. So from our past experience and this (study) we can conclude that the management of gastroschisis in resources limited countries is best done by staged closure and colostomy bag can be simple and good alternative for expensive silo.

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