

## PARTIAL GASTRIC FUNDAL VOLVULUS-INTRODUCTION OF A NEW ENTITY IN NEONATES AND INFANTS AND ITS MANAGEMENT

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### ABSTRACT

#### AIM

Bilious vomiting in neonates and infants is usually due to intestinal obstruction. But we have found that some cases of yellowish vomiting in such babies are not due to intestinal obstruction as evidenced by a Barium meal X-ray series. They seem to have a partial folding of the stomach fundus with horizontal lie of the stomach leading to increased duodeno-gastric reflux which causes the yellowish vomiting. For this pathology, a simple nonsurgical method is sufficient to relieve the patient of his symptoms. This study aims at popularizing this method of management in those select babies who have symptoms but no evidence of surgical emergency.

#### SETTINGS AND DESIGN

This is a prospective study where all babies who presented with bilious vomiting were evaluated completely. The primary mode of identifying the pathology was Barium meal X-ray study. Those babies with no evidence of intestinal obstruction were included in this study. The pathology of the stomach in these babies were identified and management was offered by positioning technique; they were evaluated after one week, one month, three months, six months, one year and every year upto 4 years of age.

#### RESULTS

During the six year study, 263 neonates and infants had presented to the Pediatric Surgery OPD with bilious vomiting. Of these 263 patients, 96 babies had no radiological features to diagnose intestinal obstruction. These 96 babies were included in this study. All the babies were admitted and nursed in the prone propped up position on bed continuously. The caregivers of the babies were instructed to do so after discharge from hospital. All the 96 babies responded favorably to this management during the two day admission as in-patients.

Of the 96 patients, 85 of them were followed up by regular OPD visits and telephonic contact, 11 were lost to follow up. Of the 85 patients, 82(96.47%) had complete resolution of symptoms. The caregivers of 3 of the babies did not seem satisfied with this mode of management and preferred to go to some other centre after a few days to a few weeks of treatment. The body weights of the 82 patients were assessed and adequate growth was recorded.

#### SAMPLE SIZE

263 babies who presented with bilious vomiting were evaluated during this six year period. 96 babies with no features of intestinal obstruction were taken as study group.

#### STUDY AREA

This study was conducted in the Department Of Pediatric Surgery at Government Medical College, Thiruvananthapuram and Kozhikode, Kerala state, South India.

#### KEYWORDS

Neonate, Vomiting, Bilious, Gastric fundus, Radiology, Barium meal, Positioning.

#### MeSH TERMS

Newborn, Vomiting, Small bowel, Obstruction, Radiology, Volvulus.

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**INTRODUCTION:** Bilious vomiting in neonates and infants is always considered ominous. These babies are immediately evaluated for features of intestinal obstruction. According to Blane CD et al,<sup>1</sup> these babies should have a detailed upper GI study. And thereafter, surgery is done as an emergency if there are features of intestinal obstruction. However, in some babies, who presented with yellowish vomiting, there were no features to suggest intestinal obstruction in any investigation. But these babies had repeated episodes of distressing yellow colored vomiting.

Plain X-ray abdomen in the erect posture showed a prominent gastric fundal air shadow. Due to the yellowish vomiting, a Barium meal follow through X-ray was done for all these babies to rule out any intestinal obstruction. The Barium series invariably showed persistence of gastric fundal hold up of Barium even in late films. These babies were diagnosed to have a ventral folding of the fundus of the stomach, aggravated by the supine position of the babies on the bed, along with the concurrent horizontal lie of the stomach causing duodeno-gastric reflux and bilious vomiting.

These babies were put in the prone propped up position always, while on bed. This corrects the abnormal folding of the stomach fundus, eases the flow of milk into the duodenum, and subsequently relieves the distressing symptom.

**MATERIALS AND METHODS:** 263 neonates and infants who presented to the Pediatric Surgery OPD or Casualty of Government Medical College, Thiruvananthapuram and Kozhikode, Kerala state, South India during the 6 year period between June 2008 and September 2014 with bilious vomiting were evaluated. Among them, 167 babies which on evaluation showed features of intestinal obstruction were duly treated and excluded from the study. 96 babies with no features of intestinal obstruction on Barium meal X-ray study were included in this study. The babies were either referred from other hospitals before or after being treated by a Pediatrician or were born in the same institution and were initially evaluated by the Pediatrician. Plain X-ray abdomen in the erect posture showed a prominent gastric fundal air shadow. According to Houston C S et al,<sup>2</sup> X-ray studies are useful to identify anomalies of bowel in children. Due to the yellowish vomiting, a Barium meal follow through X-ray was done for all these babies to rule out any intestinal obstruction. The Barium series invariably showed persistence of gastric fundal hold up of Barium even in late films. These babies were diagnosed to have a ventral folding of the fundus of the stomach, aggravated by the supine position of the babies on the bed, along with the concurrent horizontal lie of the stomach causing increased duodeno-gastric reflux and bilious vomiting.

All the caregivers were educated about this condition and prone propped up position was demonstrated as shown in the picture. As early as 1959, Carre IJ et al<sup>3</sup> demonstrated the salutary therapeutic effects of gravity aided stomach emptying for infants when kept in the upright position. According to Orenstein SR et al,<sup>4</sup> positioning is advocated for prevention of gastro-esophageal reflux. The doubts of the caregivers were gently allayed and answered. The weights of the babies were charted. The number of episodes of vomiting was recorded. The patients were discharged after two days with instructions to come for regular follow up. All patients were followed up in the subsequent OPD visits, or by telephonic contact. Follow up was continued for every year till 4 years of age.

**ETHICS:** This study was a prospective study conducted at Government Medical Colleges at Thiruvananthapuram & Kozhikode, Kerala state, South India. The management of

cases was not altered for sake of study. No drug trials were done. This study was done in accordance with ethical standards of responsible committee on human experimentation.

**OBSERVATION AND RESULTS:** All babies who presented with bilious vomiting were evaluated. Of the 263 patients, 96(36.50%) patients showed no features of intestinal obstruction in Barium meal X-ray study.

Within 24 hours	1 to 7 days	1 to 4 weeks	1 month & more
23(23.95%)	36(37.50%)	24(25%)	13(13.54%)

**Table 1: Age at presentation of study group**

No. of babies	With intestinal obstruction	Without intestinal obstruction
263	167	96

**Table 2: Causes of Bilious vomiting**

Duodenal Atresia		26
Jejunioileal Atresia		33
Malrotation	Without Volvulus	18
	With Volvulus	30
Annular Pancreas		18
Duodenal Web		16
NEC		16
Meconium Ileus		10

**Table 3: Causes of intestinal obstruction in 167 cases**

Total No.	<1.5 kg	1.5-2.5 kg	>2.5 kg
96	6	34	56

**Table 4: Weight of babies of the study group**

Total No.	<10 <sup>th</sup> centile	Normal wt	More than Normal
85	5	69	11

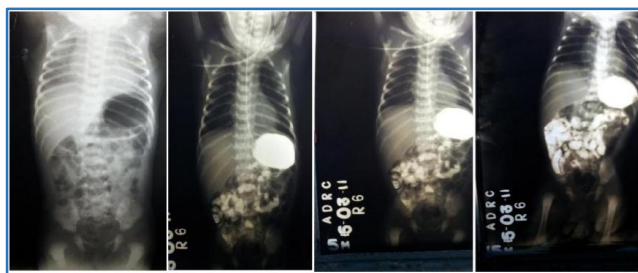
**Table 5: weight of babies after posture correction at 1 year**

Total No.	Satisfied	Not satisfied
85	74	11

**Table 6: Caregiver satisfaction**



**Fig. 1: Prone propped up posturing**



**Fig. 2: Barium Meal X-ray in the new born period**



**Fig. 3: Barium Meal X-ray at 3.5 years**

**DISCUSSION:** Pediatric surgeons often get patients who present with distressing bilious vomiting. It is considered a serious symptom and requires immediate attention. It is usually an ominous harbinger of a very serious condition i.e. intestinal obstruction that needs immediate surgical intervention. This has been stated in the study by Ken Kimura et al in 2000.<sup>5</sup> However in this study, of the 263 babies who presented with bilious vomiting, 96 (36.50%) did not have any radiological signs of intestinal obstruction. In these patients, simple prone propped up positioning of babies on bed, educating of caretakers and continuation of the procedure at home brought about a much welcome alleviation of symptoms. This vomiting was due to the ventral folding of the fundus of the stomach which is compounded by the supine posture of the baby, causing hold up of milk in the folded fundus and this together with the horizontal lie of the stomach leads to increased duodeno-gastric reflux of bile. All these put together results in yellow coloured vomitus (bile and milk). When the child is put in the prone propped up position, the fundus of the stomach unfolds by gravity, any collected air in the fundus

is burped out and gravity will assist the smooth forward flow of milk collected in the fundus into the duodenum preventing stasis and thereby reflux vomiting. There is no need for any prokinetics, H<sub>2</sub> receptor antagonists or any antiemetics. In cases of such persistent vomiting, many such babies underwent anti-reflux surgery for persistent gastro-esophageal reflux like Nissen's fundoplication in some centres. But this study has proved that a mere positioning can obviate the need for such a drastic surgical intervention.

**CONCLUSION:** This study was undertaken to stress on the following:

- The existence of an entity called "partial gastric fundal volvulus" in newborns and infants and the introduction of such a term by the author for the first time, in cases of bilious vomiting without intestinal obstruction.
- The introduction and description of the mode of treatment by the author by positioning of the babies in the prone propped up posture whenever they are on bed.
- The immediate relief of symptoms by this mode of treatment.
- The excellent response of the babies with no further episodes of vomiting and with adequate weight gain.
- The recognition and the availability of a safe, inexpensive, highly effective and a satisfying mode of treatment in those babies with nonpathological bilious vomiting without any side effects.
- The avoidance of unnecessary investigations and harmful, treatment modalities by adopting this simple, painless, efficient method which has been proven to be very effective by this study.

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