# Survival of a Neonate after Nine Days without Feeding: A Case Report

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Abstract

A male neonate from a 23 year-old mother by cesarean section without complication in labor or delivery had vomiting from birth for 9 days and lost 400 grams of body weight. He had severe dehydration upon admission to our hospital. After treating his dehydration and assessment of his problem by laboratory tests and radiography we found that he had esophageal atresia without hypoglycemia. We repaired his atresia and he is normal now 10 months post-treatment.

## Introduction

Esophageal atresia (EA) is the most common congenital anomaly of the esophagus, affecting about 1 in 4,000 neonates. Of these, more than 90% have an associated tracheoesophageal fistula (TEF). In the most common form of EA, the upper esophagus ends in a blind pouch and the TEF is connected to the distal esophagus. (1)

This type of TEF prevents the patient from swallowing anything and management of dehydration and hypoglycemia is necessary for survival. We admitted a neonate with this type of TEF; surprisingly he had tolerated dehydration and going without feeding for 9 days.

## Case presentation

A male neonate was born to a 23-year old mother via Cesarean section. The mother had a history of abortion and this was her first live delivery. The pregnancy and delivery were without complications and Apgar score was 7 for the first and fifth minutes after birth. The birth weight was 2700 grams with a head ircumference of 31 and a length of 48 centimeters. Some symptoms and signs including poor feeding, tachypnea, wheezing and vomiting developed gradually since birth. He had also a weight loss of 400 grams and increased skin turgor within the first few days of life. He had been given medications including azithromycine and theophylline during the first nine days of life; however, due to worsening of symptoms, he was referred to the pediatric department at Imam Reza Hospital, Mashhad, Iran. The primary diagnosis was hypertrophic pyloric stenosis; however, ultrasound did not confirm it. Then, chest radiography revealed a kinking nasogastric tube in his esophagus. After consultation with a neonatologist, he was diagnosed with esophageal atresia which was later confirmed by barium swallow (Fig.1 and 2).

The first laboratory results were as follows: urea 226 mg per dl, creatinine 2 mg per dl, sodium 165 meq/L, potassium 7.5 meq/L, serum glucose 100 mg/dl. We treated him for pre-renal azotemia. After 4 days, his laboratory results changed to: urea 8 mg/dl, creatinine 0.5 mg/dl, sodium 134 meq/L and potassium 5.7 meq/L. Nine-day dehydration did not lead to kidney damage and we managed to prepare him for the surgery.

After recovering from azotemia, a pediatric surgeon operated him and reported proximal atresia of esophagus and distal fistula between the trachea and esophagus (Fig. 3). After 2 weeks he was discharged and his condition and development progressed normally to date.

## Discussion:

Following birth, a newborn infant has to use its own energy depots. Soon after clamping of the umbilical cord, an increase in the levels of circulating epinephrine, norepinephrine and glucagon and a fall in insulin levels occur. These hormones concomitantly release hepatic glycogen and induce gluconeogenesis, resulting in a continuous glucose production and maintenance of the plasma glucose level.(3)

After birth, there is a fall in plasma glucose concentration in all infants, reaching its lowest value between 30 and 90 minutes after birth.

Then, in a normal neonate, the plasma glucose concentration increases to a maintained level of 40 to 80 mg/dL. In full-term newborn infants, the plasma glucose level remains steady up to 9 hours after a meal.(3) In full-term infants the plasma glucose levels obtained at random intervals during the first week after birth have ranged from 40 to 100 mg/dL, with a mean of 80 mg/dL ( Fig.4).(3) Depending on the infant's tolerance to enteral nutrition, feeding should be started as soon after birth as possible. Early feeding not only provides energy for a normal metabolism during the first hours after birth but also enhances the affectionate bond between the mother and infant. Most infants are able to tolerate breast-feeding within 4-6 hours after birth. Hence, mothers should be supported if they are willing to breast-feed their infants soon after delivery. However, feeding must be postponed until a careful evaluation if there is any condition which may affect the infant's tolerability. If it is impossible to initiate feeding for several hours, administration of parenteral fluids should be considered. (4) By the end of the first week of life, most healthy infants will require 6-9 feedings/24 hr. The required interval of feeding may vary among infants; in some, they take enough to be sufficient for as long as 4 hours, but most need to be fed every 2-3 hrs. (4)

Adults are able to maintain their blood glucose concentration near normal for a week or even a month in obese people after being totally deprived of calories. In contrast, in healthy neonates and young children plasma glucose concentrations drop shortly after fasting (24 to 36 hours) and may progressively reach hypoglycemic levels.(5)

Our report describes a neonate who despite being totally deprived of calories, tolerated going without food for nine days. He was not hypoglycemia either. Fortunately, he did not show any sign of CNS damage and the neonate developed normally followed for more than 10 months now. It is unclear how the neonate maintained his plasma glucose concentration. We failed to find a similar report in the literature.

## REFERENCES:

1. Orenstein S , Peters J Khan S , Youssef N , Zaheed Hussain S. Congenital Anomalies: Esophageal Atresia and Tracheoesophageal Fistula. In: Behrman RE, Kliegman RM, Jenson HB, Stamton BF, editors. Nelson textbook of pediatrics. 18th ed. Philadelphia: saunders: 2007. p.1543-1544

2. Sivit CJ. Diagnostic imaging. In: Martin RJ, Fanaroff AA, Walsh MC, editors. Fanaroff and Martins neonatal- perinatal medicine diseases of the fetus and infant. 8th ed. Cleveland: Mosby Elsevier; 2006. Vol 1. P. 713-31.

3. Kalhan SC, Parimi PS. Disorders of carbohydrate metabolism. In: Martin RJ, Fanaroff AA, Walsh MC, editors. Fanaroff and Martins neonatal- perinatal medicine diseases of the fetus and infant. 8th ed. Cleveland: Mosby Elsevier; 2006. Vol 2. P. 1467-91.

4. Heird WC. The feeding of infants and children. In: Behrman RE, Kliegman RM, Jenson HB, Stamton BF, editors. Nelson textbook of pediatrics. 18th ed. Philadelphia: saunders: 2007 . p . 214-225

5. Sunehag A, Haymond MW. Approach to hypoglycemia in infants and children. 2008; availableat:http://www Uttodate.com/online/content. Accered DEC J,2008.

Fig. 1. Note nasogastric tube kinking

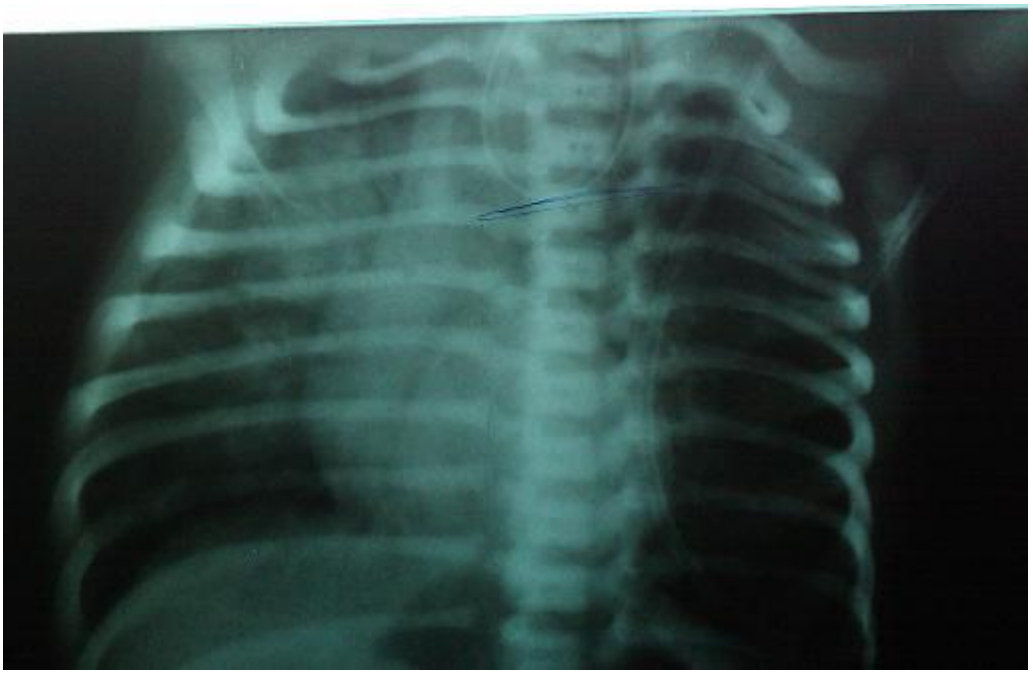

Fig.2. Confirmation of TEF by gastrographin swallow.

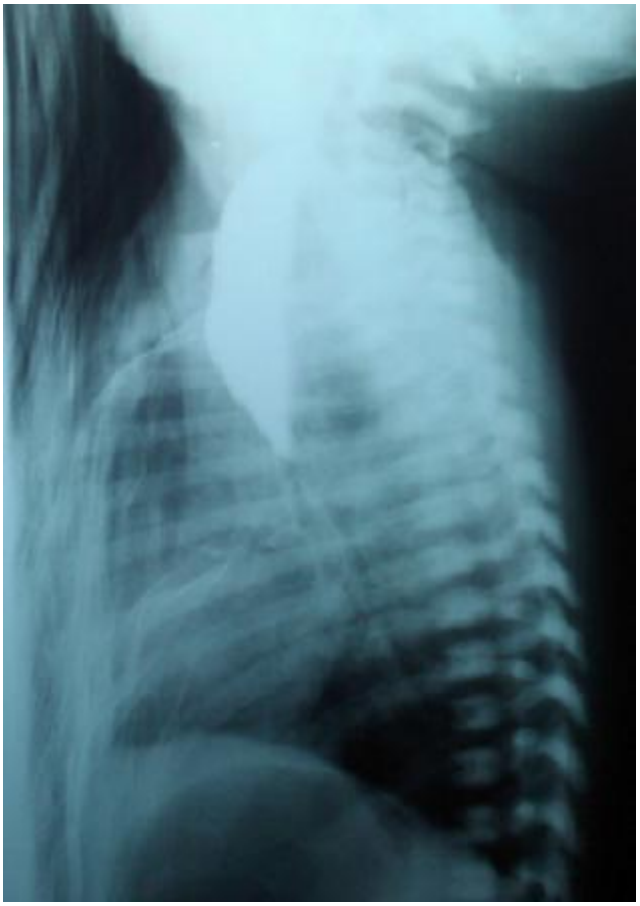

Fig.3. After surgery, note the passage of the nasogastric tube.

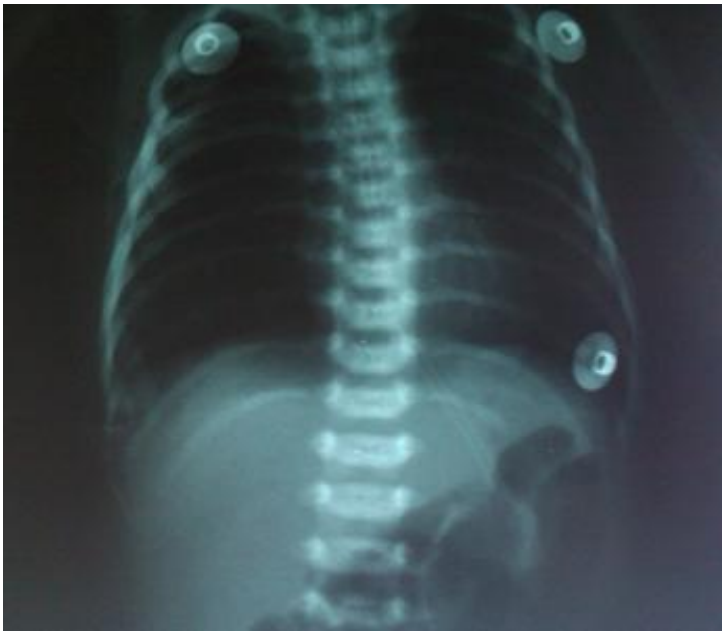

**Fig. 4** Plasma glucose levels in healthy term neonates delivered vaginally with birth weights between 2.5 and 4 kg.