

Use of continuous fluid drainage for severe polyhydramnios due to twin to twin transfusion syndrome

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Summary

Acute polyhydramnios due to twin to twin transfusion is a rare complication of twin pregnancies which, despite treatment, has a high perinatal mortality. Repeated decompression amniocentesis has been used but is associated with certain risks. We report the use of continuous, gradual fluid drainage as an alternative method of uterine decompression.

Key words: Acute polyhydramnios; Continuous fluid drainage.

Introduction

Acute polyhydramnios complicating monozygous twin pregnancy in the second trimester is due to the presence of anastomoses between the placental circulations of all monochorial, monozygous twin pairs leading to twin to twin transfusion. Its incidence has been reported as ranging from 0.5% to 9% of twin pregnancies [1-3]. Its clinical significance includes not only the extreme discomfort produced in the mother but also a high risk of membrane rupture and preterm delivery. Untreated, the perinatal mortality rate approaches 100% [2, 4].

Various techniques of treatment have been used including bed rest and tocolysis [1] and nonsteroidal anti-inflammatory drug (NSAID) therapy [5]. Reduction of fluid volume by amniocentesis has been described [2-4, 6-9] but this often has to be performed on a repeated basis. We describe our experience with the use of an intra-amniotic drain in such a pregnancy following the unsuccessful use of the more conventional methods.

Patients and Methods

A 38-year-old woman, para 6+2, presented at 18 weeks' gestation with mild lower abdominal pain. An ultrasound scan confirmed the presence of a twin pregnancy and polyhydramnios, but with no associated fetal abnormalities. She was next seen at 22 weeks' gestation when she complained of severe abdominal distension, fatigue and shortness of breath. On examination, she was noted to be normotensive but mildly anemic and tachypneic. The abdomen was tense and shiny with the uterine size equivalent to a term gestation. There was a marked fluid thrill and fetal parts were not palpable. She was admitted for bed rest and further evaluation.

Her hemoglobin concentration was 8 g/dl with an iron deficiency picture. Detailed ultrasound scanning revealed no congenital fetal abnormalities and suggested the presence of a single placenta and a membrane between the twins. The fluid volume in one sac was grossly excessive while the other sac contained a normal fluid volume. A working diagnosis of twin

to twin transfusion syndrome was made and ketoprofen 150 mg every eight hours was commenced. She was also transfused with two units of blood.

Because of increasing polyhydramnios and severe maternal discomfort, amniocentesis was performed at 23 weeks' gestation with the drainage of 700 ml of amniotic fluid. The procedure was repeated again at 24 weeks gestation when one liter of fluid was drained. On each occasion, the patient complained of severe, intermittent abdominal pains lasting for several hours and which required intramuscular (IM) pethidine for relief.

At 25 weeks' gestation rapid reaccumulation of amniotic fluid had occurred and the patient was again tachypneic and distressed. It was decided that an amniotic drain should be considered as the condition was not responding adequately to ketoprofen and intermittent drainage. The procedure was performed under aseptic technique using ultrasound guidance. Pethidine 100 mg IM was administered one hour prior to the procedure. After infiltration of the anterior abdominal wall with 1% lidocaine, a 16 GA Intracath intravenous catheter placement unit (Becton Dickinson, Critical Care Monitoring, Sandy, Utah) was inserted into the sac which contained excessive fluid (twin 2). The patient tolerated the procedure well and the cannula was secured by sutures.

One liter of fluid was allowed to drain over each subsequent 24-hour period. An amniotic fluid sample was also sent on a daily basis for culture, blood was analyzed for leucocytosis and the patient received ceftriaxone 1g daily by IM injection. Steroids were also administered to assist with fetal pulmonary maturity in anticipation of delivery. The drain was left in situ for six days and the patient felt significantly better in relation to abdominal discomfort and respiratory effort over that time. On each of the last two days, 2.5 liters of fluid were allowed to drain. The drain was removed at 26 week's gestation because of the favorable effect obtained and being mindful of the risk of chorioamnionitis. The puncture site was treated with antibiotic powder and sterile dressing. No bacterial contamination of the amniotic fluid was ever noted. Using this method, a total of nine liters of amniotic fluid were removed from the single sac. During all drainage procedures, maternal vital signs were carefully monitored and fetal non-stress testing was performed. There was no suggestion of placental abruption and no tocolysis was used.

Frequent ultrasound scanning revealed that twin 1 was becoming increasingly sluggish and that twin 2 was developing hydrocephalus and scalp edema. Elective cesarean section was

performed at 28 weeks' gestation. Twin 1 weighed 710 g and had Apgar scores of 1 and 4 at 1 and 5 minutes, respectively. Twin 2 weighed 1,460 g and had Apgar scores of 3 and 6. Both were male. Postoperative recovery was uneventful.

Blood investigations revealed that twin 1 was the donor having a hematocrit of 37%. The child was placed on ventilatory support but died within six hours of birth. Postmortem examination revealed hypoplasia of the lungs, cardiac hypertrophy, patent ductus arteriosus and severe intrauterine growth retardation. There were no congenital fetal abnormalities. Twin 2, the recipient, had a hematocrit of 58% at birth and had mild hydrocephalus and scalp edema. Management included ventilatory support, blood transfusion and antibiotic coverage. Superficial swabs and blood cultures revealed no bacterial growth. Although the child initially did well, he later deteriorated with the development of respiratory distress syndrome, jaundice and disseminated intravascular coagulation. He died on day 6 after birth and postmortem examination revealed no congenital abnormalities.

Discussion

The management used in this case initially followed the methods described in the literature. In twin pregnancy with acute polyhydramnios presumed to be due to the twin to twin transfusion syndrome, urine output of the larger fetus has been shown to be dramatically increased [9] and nonsteroidal anti-inflammatory drugs have been used [5] because of their ability to reduce fetal urine output [10-13]. However, fluid volume was not demonstrably reduced in this patient with the use of ketoprofen.

Decompression amniocentesis is well established. Reported volumes drained range from 300 ml to almost seven liters at a single tap and up to a total of 11 liters have been drained [8]. The risks of amniocentesis include trauma to the fetus or cord and placental vessels [3] and the induction of premature uterine activity if large volumes are drained. These risks can be minimized by performing the procedure under ultrasound guidance and by removing fluid slowly, perhaps even with the addition of tocolysis [1, 3, 14]. However, sufficient fluid has to be drained to provide symptomatic relief to the patient and to decrease the likelihood of early rupture of the membranes and labor. As was the situation in this patient, the anxiety and discomfort associated with recurrent taps must also be considered.

The use of a continuous amniotic fluid drainage system addresses these concerns. We were able to drain a total of nine liters of fluid slowly over six days. Maternal anxiety was kept to a minimum and the discomforts and risks of repeated taps were reduced. The likelihood of inducing uterine activity was reduced through the very gradual release of fluid but the large volume of released meant a significant reduction in the discomfort and dyspnea felt by the patient. The most significant danger of inserting a drain is the possibility of chorioamnionitis and fetal infection. We believe that by adhering to techniques of asepsis and with the use of prophylactic antibiotics, this is unlikely to occur. There was no evidence of amniotic fluid infection on repeated culture. In addition, chorioamnionitis is often associated with premature rupture

of membranes and labor and this did not occur in our patient. Following removal of the drain, the twins were not delivered for a further 27 days during which there were no clinical signs of sepsis and no elevation of maternal white blood cell count. Furthermore, superficial swabs and septic screens of the twins also revealed no evidence of congenital or neonatal sepsis.

The fact that the patient did not require further decompression after removal of the drain is interesting. It may be due to increasing fetal blood volumes with increasing gestation counteracting the negative hemodynamic effects of placental anastomoses [8] and uterine decompression may help the fetuses to outgrow the effects of placental anastomoses [9]. In theory, therefore, if the basic pathogenic mechanism of the twin to twin transfusion syndrome is gradually overcome, urine output of the polyuric twin should normalize and the rate of accumulation of fluid should decrease.

Reported survival rates in this condition have varied from 0% [15, 16] to 79% [17]. An analysis of 15 reports of amniocentesis prior to 28 weeks in twin to twin transfusion syndrome found an overall survival of only 33 of 96 twins [8]. The same authors in their series of 19 cases noted an association between poor survival and increasing severity of the condition as reflected by volumes of fluid drained and intertwin disparity in size. The condition of our patient was extremely severe with 10.7 liters of fluid being drained in total, with the initial decompression at 23 weeks. The disparity in fetal size was extreme with the weight of twin 2 being more than twice that of twin 1. The failure of either twin to survive is therefore not surprising. Nevertheless, our technique of amniotic fluid drainage was effective in providing relief to the mother and in prolonging the pregnancy to a period of gestation more compatible with delivery and survival. We believe that not only is this an effective technique but that it offers distinct advantages over the more traditional method of repeated amniocentesis and deserves consideration in selected cases of this rare condition.

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