The literature on conjoined twins emphasizes the need for careful investigation and planning for the separation procedure.\textsuperscript{1,2} Surgical separation has been carried out on 7 pairs of conjoined twins at National Taiwan University Hospital since 1979. We report the successful separation, at 7 days of age, of xiphoomphalopagus conjoined twins who had a total body weight of only 3502 g.

**CASE REPORT**

A pair of female conjoined twins were identified by prenatal sonography at 32 weeks’ gestation. They were delivered by emergency cesarean section at 35 weeks’ gestation after the membranes ruptured prematurely. The combined body weight of the twins was 3502 g. Both babies had good Apgar scores. They were joined face to face from the lower sternum to the infraumbilical area. An omphalocele, 3 × 3 cm in dimension, was noted on the lower part of the conjoined bridge (Fig. 1).

MRI and aortography showed a fused liver with no major vascular connection. Echocardiography indicated a patent ductus arteriosus in each baby. No other major anomalies were found. The patent ductus arteriosus had disappeared in twin A by 3 days of age but persisted in twin B.

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Accepted for publication Sept. 25, 1996

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The hourly urine excretion of the two babies was quite different: 1.1 mL/kg in twin A and 7.6 mL/kg in twin B. Tachypnea and tachycardia were noted in twin B on the fourth day. Indomethacin (0.4 mg/12 h for 3 doses) was given to twin B for her persistent patent ductus arteriosus and early signs of heart failure on the fifth day. Twin B’s patent ductus arteriosus was closed 2 days later. However, twin A was anuric for 30 hours after indomethacin was given to twin B. As a result, an emergency separation was necessary on the seventh day.

FIG. 1. Xiphoomphalopagus conjoined twins showing the fused lower sternum, omphalo-bridge and a small omphalocele (arrow).
Surgical technique

A circumflex incision line was made with 2 cm deviation to the right side of each baby. The fused lower sternum was divided sharply with scissors, and the common peritoneal cavity was opened. Each baby had a normal stomach, duodenum, gallbladder, pancreas, spleen, small intestine and colon. However, the left lobes of the two livers were fused. The central part of the engorged fused area was divided by ultrasound aspirator. A 7 × 5 cm² fusing surface of the livers was demonstrated. Multiple cross-circulating vessels were found in the conjoined portion of the liver. After checking bleeding and placing drainage tubes (2 for twin B, 1 for twin A), the abdominal wall defect was closed in layers. The skin flap was adequate. The immediate postoperative body weights were 1890 g for twin A and 1558 g for twin B. Both twins stood the procedure well. The total operation time was 3 hours and 47 minutes. Each baby received 60 mL of fresh blood during the operation.

The postoperative course was uncomplicated. The urine of twin A started to flow 4 hours postoperatively. The twins were discharged 24 days after the operation. At follow-up 8 months after separation, both babies were healthy, thriving and developing well.

DISCUSSION

The reported incidence of conjoined twins is extremely variable. Prenatal sonography can identify the conjoined anomaly early in the second trimester of pregnancy. The pregnancy can be terminated if the anomaly is found by prenatal examination. However, the anomaly may be missed by a poorly performed sonographic examination. Conjunctions may be either symmetric or asymmetric. The results of separation depend on the form of connection and the associated anomalies. The separation of ischiopagus conjoined twins is a surgical challenge, yet the success rate is usually high in omphalopagus conjunctions.

The optimum age for surgical separation depends on the conjoined form. In the more complex forms, a delay is recommended to achieve a better nutritional state. Otherwise, early separation is common practice to minimize complications such as thoracolumbar scoliosis, growth retardation or urinary tract infection. However, separation for conjoined twins is usually performed after the neonatal stage except in emergency situations. Sometimes, emergency separation must be performed to salvage the healthier twin if the other twin is severely malformed.

Our case may represent the smallest xiphoomphalopagus conjoined twins separated successfully. Originally, the separation of the twins was scheduled to take place when they were at least 1 month old. However, it became an early emergency separation because of the anuric status of twin A. The operation improved the anuric status of twin A, because it prevented the unbalanced cross-circulation from twin A to twin B and it cancelled the side effect on renal function of indomethacin which had been given to twin B.

If 1 twin is expected to die as a result of severe congenital abnormalities, abdominal wall and skin closure should favour the more viable twin. Birmore and associates reported an urgent separation of omphalopagus tetrapus conjoined twins on day 14, when the survival of one was threatened by the severely malformed counterpart.

In our report, a fair circumflex incision was made, and the conditions of both twins were stable after separation. This experience showed that an emergency separation procedure in small, premature, xiphoomphalopagus conjoined twins is feasible, and a successful result can be expected.

References