Letter to the Editor

A Single Centre Experience with Selective Termination of Anomalous Foetus in Multifoetal Pregnancies

Dear Editor,

The percentage of multiple births has increased over the past 3 decades, primarily as a result of advanced maternal age, the greater use and success of assisted reproductive technologies. The incidence of foetal malformations is higher in multifoetal pregnancies compared to singletons.[1] In dizygotic (DZ) twins, there is essentially more than twice the risk per pregnancy (independent probabilities per foetus); while in monozygotic (MZ) twins, there is an increased risk of structural malformations and the rates of Mendelian and chromosomal abnormalities are comparable to those of singletons. In both MZ and DZ twins, nearly 85% of cases have malformation that is confined to one foetus and the co-twin is normal.

After the diagnosis of foetal anomaly with an apparently normal co-twin, a couple would be faced with the dilemma of the following 3 options: expectant management, terminate the whole pregnancy or selective termination (ST) of the abnormal foetus. Aberg et al[2] reported the first successful selective birth from a twin pregnancy discordant for Hurler syndrome in 1978 following which Kerenyi and Chitkara[3] reported selective birth for twins discordant for Down syndrome in 1981. Throughout the 1980s, a number of small series of second trimester selective terminations appeared in the literature, showing high loss rates and morbidity.[4-6] The main variable in selecting the technique of ST is chorionicity. In dichorionic (DC) twins, intracardiac injection of potassium chloride (KCl) in the affected foetus is safe for the normal co-twin as vascular communications do not exist; while in monochorionic (MC) pregnancies, the risk of passage of KCl into the circulation of the normal co-twin through placental anastomosis precludes this technique.

Materials and Methods

All cases of DC twins and triplets discordant for congenital defect that underwent selective termination from August 2005 and December 2012 at the KK Women's & Children's Hospital were analysed retrospectively. Parents were informed about the technical aspects and the pros and cons including procedure-related foetal loss rate prior to the procedure. They were counselled by neonatologists and paediatric surgeons regarding perinatal management, postnatal course, surgery and prognosis of congenital defect. Hospital ethics committee approval was sought. ST was performed at the Antenatal Diagnostic Centre as an outpatient procedure by trans-abdominal percutaneous injection (by 20 G spinal needle) of intracardiac KCl in the anomalous foetus under ultrasonographic guidance. A concentration of 7.45% KCl was used and 3 mL to 10 mLwas enough to achieve foetal asystole.

Data were collected on indications for the procedure, the week the procedure was performed, which foetus was terminated (presenting vs non-presenting foetus), pregnancy losses, and gestational age at delivery, birth weight and neonatal outcome. Indications were divided into chromosomal aberrations and structural anomalies. Foetal loss was defined as unintended loss of the whole pregnancy before 24 weeks of gestation. Perinatal data were obtained by the clinical charts for neonates delivered in our centre.

Results

This series consists of 12 DC multifoetal pregnancies discordant for congenital defect in which ST was performed. Mean maternal age was 35 years (range, 30 to 40). Eleven out of 12 were in vitro fertilisation (IVF) pregnancies. Congenital defects of the anomalous foetus are shown in Table 1. Ten mothers (83.3%) had ST for foetuses with structural defects, 4 (40%) of which were abnormalities of the central nervous system. Two (16.7%) of the cases had ST for trisomy 18 foetuses with associated structural defects.

The mean gestational age (GA) at the time of the procedure was 18.3 weeks (range, 15 to 22; SD), and 7 (58.3%) were performed before 18 weeks. In 2 cases (16.7%), the lower or presenting foetus was terminated. In 8 pregnancies (66.7%), twins were reduced to singleton. Four (33.3%) were triplets, out of which 2 were trichorionic triamniotic and reduced to twins due to structural anomaly and 2 were DC triamniotic reduced to singleton. One of them being with MC pair with stage III b twin-to-twin transfusion syndrome (TTTS) and so reduced to singleton. The second patient had foetal reduction in her native country in the first trimester and later did ST due to omphalocele at our institution. ST was technically successful in 100% of the reported cases; there were no failed procedures.

Perinatal outcomes are shown in Table 2. One mother went back to her native country after ST and was lost to follow-

Table 1. Congenital Defect of the Anomalous Foetus

Indication (n = 12)	n (%)
Chromosomal defects	
Trisomy 18 (47XX + 18)	2 (16.7%)
Strawberry head, VSD, persistent Left SVC	
Cleft lip, absent right forearm, cerebellar gap	
Structural abnormality and normal chromosomes	10 (83.3%)
CNS	
Arnold-Chiari malformation, hydrocephaly, lumbar spina bifida, meningocele	
Caudal regression syndrome	
Spina bifida, lumbar spine kyphosis	
Spina bifida at L3 with neural tissue	
Non-CNS	
VSD, overriding aorta, cardiomegaly, poor contractility	
Hypoplastic left heart, single ventricle complex, pulmonary atresia, cystic hygroma	
Omphalocele	
Body stalk anomaly/severe oligohydramnios	
Body stalk anomaly/spine abnormality/heart outside body	
Stage IIIb TTTS*	

CNS: Central nervous system; SVC: Superior vena cava; TTTS: Twin-to-twin transfusion syndrome; VSD: Ventricular septal defect
*Triplets reduced to singleton terminating monochorionic pair.

Table 2. Overall Perinatal Outcomes

	n = 11†
Foetal loss <24 weeks	0
Other complications	
PPROM	2
Preterm delivery of the terminated twin	0
Healthy newborns	13*
GA at delivery (weeks)	35 weeks
<33 weeks	3
33 – 36 + 6 weeks	4
37 – 40 weeks	4
Birth weight (g)	2194.6 g
Hospital stay	
Admission (average stay)	
Peripheral ward	6 (2.6 days)
Special care nursery	3 (20.3 days)
Neonatal ICU	2 (80.5 days)

GA: Gestational age; ICU: Intensive care unit; PPROM: Preterm premature rupture of membranes; ST: Selective termination
*Includes 2 sets of twins.
†One went back after ST.

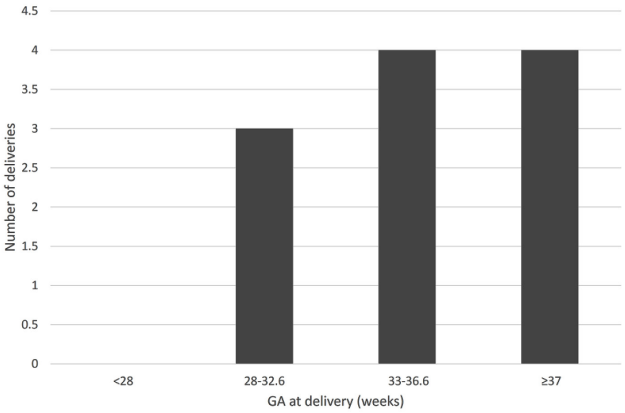

Fig. 1. Gestational age distribution at delivery.

up. ST was followed by the delivery of a healthy newborn in 100% (13/11 with 2 sets of twins) of the cases. There was no report of unintended loss of the whole pregnancy before 24 weeks. Two cases had perinatal complications. The first case was a ST at 16 weeks of a non-presenting foetus affected by caudal regression syndrome. At 25+1 weeks of gestation, the patient had preterm premature rupture of membranes (PPROM). She was managed expectantly and gestation ended at 32.1 weeks with a healthy newborn of 1548 g with Apgar of 6,7. The baby required neonatal ICU care and was discharged stable on 65th day of life. The second case was ST at 18 weeks of a non-presenting foetus with body stalk anomaly. The patient presented with PPROM at 19+1 weeks. Antibiotic therapy was given and later corticosteroids for foetal maturation were administered at 24+4 weeks. The patient delivered spontaneously at 28.4 weeks to a baby girl that weighed 1066 g with Apgar of 0,5. She required prolonged intensive care unit (ICU) stay with issues of hyaline membrane disease, persistent pulmonary hypertension, neonatal systemic hypertension. The baby was stable at discharge.

Spontaneous delivery between 28 to 33 weeks and 33 to 36+6 weeks of pregnancy occurred in 3 cases (27.3%) and 4 (36.4%), respectively. The remaining 4 (36.4%) mothers delivered at term (Fig.1). The mean birth weight was 2194 g (range, 1066 g to 3205 g).Seven mothers were delivered by caesarean section while the remaining 4 had vaginal delivery. Six (54.5%) newborns were admitted to peripheral ward with an average 2.6 days of stay, 3 (27.2%) went to special care nursery for an average duration of 20.3 days and 2 (18.1%) of them required ICU care with an average stay of 80.5 days. All surviving newborns were well at discharge except 3/13 (23%) who had postural talipes equinovarus.

There were no instances of clinically evident or laboratory-diagnosed coagulopathies in mothers. No ischaemic damage or coagulopathies were observed among the surviving neonates. No significant linear relationship between GA at-procedure and GA at-delivery was noted.

Discussion

ST was initially developed for severe anomalies with a risk of handicapped- or mentally-challenged infants. Nowadays, it is even contemplated in DZ twins discordant for lethal defects. The decrease in foetal loss rate associated with the procedure, compared with the risk of adverse perinatal outcome for the normal foetus in some lethal defects, such as polyhydramnios in anencephaly, and the psychological impact on the parents if the pregnancy reaches term, has led to ST becoming an option.[7-8]

The natural history and outcome of pregnancies complicated by a variety of discordant anomalies in twins have been addressed by a number of studies which suggested increased likelihood of premature delivery.[9-10] Lynch et al[11] studied 69 DC twin pregnancies that underwent ST for structural, chromosomal or Mendelian disorders at a mean GA of 19 weeks. There were only 2 women who miscarried and the remaining delivered at a mean GA of 36 weeks. Selectively terminated gestations had a lower rate of preterm delivery than control twin pregnancies. GA of 20 weeks or more and termination of the presenting twin increased the risk of preterm delivery and low birth weight. Yaron et al[12] reported a pregnancy loss rate of 9.7% after first trimester ST, compared to 7.8% for terminations done later in gestation. Another international collaborative study[13] involving 402 DZ pregnancies managed by ST reported foetal loss rate of 7.5%. Eddleman et al[14] reported overall foetal loss rate after ST of 4% (2.4% in twins and 12.5% in triplets). In 2012, Eugenia Antolı´n Alvarado et al[15] reported similar results.

Conclusion

In spite of the limitations of the present study (i.e. its small numbers and retrospective nature), the selective termination for a DZ abnormal twin appears to be safe and effective in experienced hands. The incidence of premature deliveries was relatively low and spontaneous loss rate was none. Perinatal outcomes are good and maternal morbidity is minimal. Hence, our series reported good outcomes although careful patient selection and comprehensive discussion with parents are essential. The benefits expected from selective termination should be weighed against the potential risk of the procedure concerning the unaffected twin.

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