

# Multifetal Pregnancy Reduction – A Method to Improve Perinatal Outcome in Higher Order Pregnancies

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**OBJECTIVE** – To study the perinatal outcome after embryo reduction in multifetal pregnancy. **METHOD** – Eight patients with high order gestation (3 to 5) underwent fetal reduction by intracardiac injection of potassium chloride under ultrasonic guidance. **RESULTS** – In one woman with quintuplet pregnancy, the fetuses were reduced to two. Of the five women with quadruplet pregnancy, four were reduced to two and one was reduced to three fetuses. In two triplet pregnancies, the fetuses were reduced to two. One patient aborted at 21 weeks, two delivered at term and five delivered preterm. All babies did well. **CONCLUSION** – Multiple pregnancy reduction is a safe procedure and a viable option to reduce complication rates in high order pregnancies.

**Key words :** multifetal pregnancy reduction, multiple gestation, prematurity

## Introduction

The number of women conceiving more than two fetuses is increasing dramatically as a result of successful infertility therapy with ovulation inducing agents and assisted reproductive technology. Higher order multiple gestations have an increased risk of premature delivery and its attendant sequelae of increased neonatal mortality or irreversible morbidity. Multifetal pregnancy reduction is a safe and effective approach designed to decrease the adverse outcome associated with grossly preterm deliveries.

We report the perinatal outcome in eight women with multiple pregnancy who underwent fetal reduction. One woman presented with quintuplet pregnancy, five with quadruplet pregnancy and two with triplet pregnancy. The number of fetuses in seven of these pregnancies was reduced to two and in one quadruplet pregnancy, it was reduced to three.

## Methods

From January 1997 to March 2001, eight fetal reduction procedures were performed at our hospital. In all patients, the procedure was performed between 9-13 weeks of gestation. Before undertaking the procedure, couples were counseled about the procedure and its potential risks and a written consent was taken.

All these procedures were performed by transabdominal approach under ultrasound guidance. The abdomen was cleansed with povidine iodine and a convex-array transducer 3.5 MHz in a sterile sheath was used. Under direct ultrasonic visualization, with the transducer held by the operator, a 20 gauge disposable spinal needle was introduced into the thorax of one of the most accessible fetuses. Whenever possible the needle tip was placed directly into the fetal heart and 1 to 2 ml of 2 meq/mL potassium chloride solution was injected and the fetal heart was monitored for asystole. After asystole had been observed for 60 seconds, the needle was withdrawn. The procedure was repeated in one or more additional fetuses if necessary. After the procedure, patients were observed for any evidence of uterine contractions, vaginal bleeding, or leakage of liquor amnii. Prophylactic antibiotics were given for 48 hours. Before being discharged, all patients underwent a repeat scanning. If cardiac activity was observed in a fetus that had been subjected to a termination procedure, the procedure was repeated one week later. Repeat procedure was required in four fetuses.

## Results

Fetal reduction procedures were performed in eight patients who were referred to us because of their multifetal pregnancies. All the conceptions had occurred after induction of ovulation carried out at outside clinics, in five women with clomiphene citrate and in three with gonadotropins. Two of the latter three had polycystic ovarian disease. None of the eight women gave history of ovarian hyperstimulation. One woman presented with five fetuses, five with four and two with three. The number of fetuses in seven of the pregnancies was reduced to two and in one quadruplet pregnancy it was reduced to three (Table I).

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Table I. Clinical data and outcome of pregnancies in patients who underwent fetal-reduction procedure

Serial Number	Weeks of gestation	No. of fetuses		Outcome	Birth weight (Grams)
		Before	After		
1	12	4	2	Preterm labor at 34 weeks; delivery of twins both alive and well	2100 1800
2	10	5	2	PROM at 36 weeks; delivery of twins, both alive and well	2210 2610
3	12	3	2	Term delivery of twins, both alive and well	2820 2640
4	10	4	2	PROM at 32 weeks; delivery of twins both alive and healthy	1480 1320
5	10	4	3	LSCS at 33rd week for APH; Triplets, all alive and well	1310 1242 960
6	13	4	2	PROM at 21 weeks; delivery of stillborn twins	500 462
7	12	4	2	Term delivery of twins; both alive and well	3012 2826
8	11	3	2	Induced preterm delivery of twins at 36 weeks due to PIH; both alive and well	2600 2451

PIH - Pregnancy induced hypertension APH - Antepartum hemorrhage PROM - Premature rupture of membranes

In cases number 1, 3, 7 and 8 (Table I), termination of one of the fetuses was thought to have been successful after the initial procedure. However, ultrasound examination 24 hours following the procedure revealed that cardiac activity had resumed. In all these four cases, the procedure was repeated successfully on the same fetus one week later.

In case number 6, the number of fetuses was reduced from four to two at 13 weeks of gestation. Two weeks later the patient developed cramping lower abdominal pain and was advised rest. Ultrasound examination revealed two living fetuses. There was no evidence of infection. The cramping continued intermittently until 6 weeks after the procedure when membranes ruptured spontaneously and stillborn twins were delivered. Examination of the fetuses revealed no anomalies or infection.

Case number 5 had a quintuplet pregnancy to begin with. Fetal reduction was performed in two fetuses and a week later three live fetuses were seen. The

patient refused to undergo repeat procedure and the pregnancy was continued. She had an emergency lower segment cesarean section at 33 weeks of gestation due to antepartum hemorrhage. Three live babies were delivered.

#### Discussion

The incidence of high order multiple pregnancy has significantly increased in last two decades after the advent of fertility drugs like human menopausal gonadotropin, invitro fertilization and multiple embryo transfer. The maternal and fetal complications associated with high order multiple pregnancies are well known. Very few quadruplet pregnancies reach the period of viability, and most pregnancies are complicated by preterm labor, preeclampsia and problems associated with tocolytic therapy including life threatening pulmonary edema<sup>12</sup>.

Most of these high order multiple pregnancies conceived after the treatment for infertility wh

involves a lot of emotional stress and economic commitment from the patient. The financial burden of raising three or more children, especially when one or more may be handicapped as a result of prematurity is heavy. With current advances, three options can be offered to these women.

1. Continue the pregnancy without any intervention and perhaps face long term sequelae of prematurity or even the possibility of losing all fetuses due to prematurity.
2. Terminate this pregnancy and await for a next conception which may or may not occur.
3. Selectively terminate few embryos to improve the obstetric outcome for those that are left.

The morality and ethics of terminating apparently normal embryos had been questioned. Finnerty et al<sup>3</sup> have very lucidly given an account where they have used the various principles of ethics and proven that elective termination is a proper choice. The maternal complications of high order multiple pregnancy, sequelae of extremely premature infants and the difficulty of coping with preterm infants makes it an obligation to try to produce the best possible outcome by limiting the total number of embryos. Evans et al<sup>4</sup> have also discussed ethical issues.

There have been various methods designed for fetal reduction. Dumez and Oury<sup>5</sup> described the transcervical aspiration procedure. Under direct transabdominal ultrasound visualization, an 8 mm suction catheter is introduced through the internal os and directed towards the lowest sac. A 50 ml syringe is then attached to the catheter and hand suction is used to aspirate the fetus from the lowest sac. Disadvantages of this procedure are high rate of pregnancy loss, bleeding and possibility of introduction of infection. Other techniques include direct needle trauma to the heart, aspiration of fluid and air embolization, and fetal exsanguination<sup>5</sup>.

The fetal heart is extremely resistant to insults in utero as was evident in our cases 1,3,7 and 8 where we had to repeat embryo reduction procedure for some of the fetuses. These techniques require considerable expertise since they involve direct needle placement in the circulation<sup>4</sup>. Berkowitz et al<sup>6</sup> have described the technique of injecting a cardiotoxic drug (2-7  $\mu$ mol of KCL) adjacent to the fetal heart under ultrasound guidance in order to decrease the duration of the procedure and increase its effectiveness. This procedure is now universally accepted for fetal reduction.

Although, it is technically feasible to perform fetal reduction at an earlier gestation, it has been shown that fetal reduction performed between 11-12 weeks of gestation<sup>5</sup>, gives time for spontaneous fetal reduction to occur and also for the woman to reconsider her decision of opting for embryo reduction. However, there is no advantage gained in waiting beyond 12 weeks since there is very little chance of spontaneous fetal absorption beyond 12 weeks and there is a possibility of coagulation disorder due to late fetal demise and increased psychological stress to the woman.

Evans et al<sup>7</sup> have collected data on 1789 patients undergoing multifetal pregnancy reduction at nine centers in five countries. They have reported an overall pregnancy loss of 11.7% after fetal reduction and 4.5% early premature deliveries. Pregnancy loss rate exceeded 20% for patients starting with sextuplets or more and was only 7.6% for triplets. Corresponding early premature delivery rate was 11.5% for sextuplets and 3.3% for triplets. Their study did not show any difference in the overall outcome when transabdominal and transvaginal methods were compared. However, a recent study has shown that transvaginal selective embryo aspiration at 7.5 weeks of gestation is associated with a pregnancy loss rate of 6.7% and preterm delivery rate of 4.4% which are significantly less than reported by other studies. Besides they had lower immediate post-procedure complications such as uterine bleeding, contractions, rupture of membranes and infections<sup>8</sup>. Of our eight cases, one (12.5%) had total pregnancy loss 8 weeks after fetal reduction procedure.

There has been considerable debate regarding the total number of embryos to be reduced. Most advocate reduction to twins. The incidences of threatened abortion, pre-eclampsia, ante-partum hemorrhage and preterm labor are more in triplets than in twins<sup>9,10</sup>. Prolonged hospitalization might be required in triplet pregnancy and neonatal morbidity and mortality rates tend to be higher in triplets in comparison to those in twins<sup>11</sup>.

Thus, when faced with the problem of high order multiple pregnancy, fetal reduction is an ethically right choice and gives the best possible outcome. Choosing the right protocol for ovulation induction, endocrine and ultrasonic monitoring during induction cycles, and limiting the number of embryos transferred after IVF are just a few steps towards prevention of multiple pregnancies. However, multiple pregnancy may occur even in the best of hands and therefore, fetal reduction comes as a very handy tool both to the doctor as well as to the patient.

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