

Supraventricular tachycardia in one of the twins: The ethical dilemmas involved in treatment

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ABSTRACT

The pediatric cardiologist now has an important role to play in fetal medicine. They are often called upon to manage fetal cardiac problems such as arrhythmias or perform fetal cardiac interventions such as balloon valvuloplasty or atrial septostomy. In these scenarios, it becomes very important for the pediatric cardiologist to understand the concepts of "fetus as a patient," "viability," etc., and their implications in management. We try to shed light on these principles through our case scenario of managing supraventricular tachycardia in one of the fetuses of a twin pregnancy.

Keywords: Beneficence, fetal arrhythmia, fetus as a patient

INTRODUCTION

Fetal arrhythmias are detected in 2% of unsuspected pregnancies during routine obstetric ultrasound. Majority of them are benign. However, serious arrhythmias such as supraventricular tachycardia (SVT) and atrial flutter are common and can lead to fetal hydrops, premature delivery, and death if not aggressively treated.^[1] SVT in one of the fetuses of a multiple gestation is uncommon.^[2-4] In the treatment of fetal arrhythmia, there is no consensus on the regimen of drugs, and the protocol varies from institution to institution.^[1,5] We describe such an unusual case and the ethical dilemmas involved.

CASE REPORT

A 23-year-old primigravida with 25 weeks' gestation presented to us with a dichorionic-diamniotic twin pregnancy. She conceived by *in vitro* fertilization resulting in a triplet pregnancy. Triplet reduction was done at 16 weeks' gestation. Her obstetric ultrasound showed twin 1 having intermittent atrial ectopics and

persistent SVT [Figure 1a and b]. Twin 2 was normal. After obtaining informed consent, the mother was loaded with oral digoxin (1 mg/24 h) followed by 500 µg/day in two divided doses. After 36 h, twin 1 developed pericardial effusion [Figure 1c] and cardiomegaly. In view of impending fetal hydrops, oral sotalol was started at 160 mg/day in two divided doses. It was increased to 240 mg/day in three divided doses due to persistent SVT. Twin 1 reverted to sinus rhythm on day 4 of admission [Figure 1d] and twin 2 was healthy. The patient was discharged on day 7 of admission.

On follow-up after 2 weeks, both twins and mother were healthy, and pericardial effusion resolved in twin 1. Digoxin was stopped and the dosage of sotalol was tapered gradually to 80 mg/day and continued till delivery. She was delivered by elective cesarean section at 36 weeks' gestation, twin 1 and 2 weighing 2.16 kg and 2.1 kg, respectively. At present, they are 3 months of age with no recurrence of arrhythmia.

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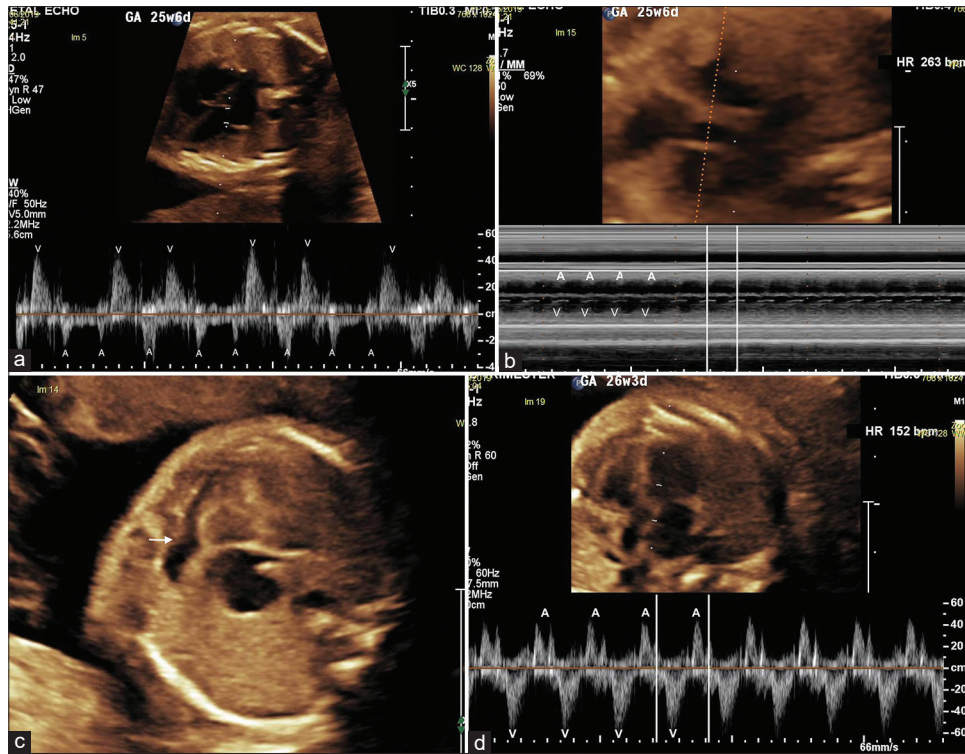


Figure 1: (a) Pulsed-wave Doppler of left atrial inflow and outflow tracts showing multiple nonconducted atrial ectopic beats. A: Atrial wave, V: Ventricular wave, (b) M mode tracing showing supra-ventricular tachycardia with 1:1 conduction and short ventriculoatrial interval. Heart rate is 263 beats/min. A: Atrial contraction, V: ventricular contraction, (c) two-dimensional fetal echocardiography showing pericardial effusion. White arrow – Pericardial effusion. (d) Pulsed-wave Doppler of left atrial inflow and outflow tracts showing sinus rhythm. Heart rate is 152 beats/min. A: Atrial wave, V: Ventricular wave

DISCUSSION

The concept of “fetus as a patient” was mainly the work of McCullough and Chervenak who opposed the word “unborn child.” “Unborn child” was used by opponents of abortion to confer independent moral status to the fetus, meaning that parents and practitioners had a moral obligation to protect and promote the interests of the fetuses above everything.^[6] The authors, however, emphasized more on the dependent moral status where the fetus could not be seen as a separate entity.^[6] Hence, the physician had beneficence-based obligations to the mother and fetus which had to be balanced against autonomy-based obligations to the mother. The fetus, of course, being neurologically immature, there was no question of fetal autonomy.^[7,8]

“Beneficence” simply means that clinical benefit should outweigh harm, based on sound evidence-based treatment. It would be common for the physician’s recommendations to sometimes go against the mother’s autonomy.^[7,8]

In our situation, we had three patients and three possible treatment options. They included giving transplacental antiarrhythmics, no treatment, or urgent delivery. Our team opted for therapy. Here, we could justify our

beneficence-based obligations to twin 1, but twin 2 and mother were exposed to side effects of the drugs with unknown consequences and harm.

The mother initially opted for no treatment. Her reasoning being, she could at least save twin 2. This resulted in conflict with our recommendations. Due to the scarcity of similar case reports, lack of treatment guidelines,^[2-4] and unpredictable side effects, sound evidence-based recommendations were difficult. Based on the limited literature available, our experience, and constant counseling, the mother eventually made an informed decision to treat. If conflict still persisted, would legal methods have to be sought? If the court ruled in our favor, wouldn’t the decision be in conflict with the mother’s autonomy?

The third option involved urgent delivery. Here lies the importance of the concept of “viability.” A fetus is said to be viable if it is of sufficient maturity to survive in the neonatal period and attain independent moral status given the available technological and professional support.^[7,8] In high-income countries, this is generally between 24 and 25 weeks.^[9] In India, it has been fixed administratively at 28 weeks,^[10] but there is a wide interregional variation of technological support available. Hence, the issue of viability becomes

many times institution based.^[11] If urgent delivery was resorted to, both the twins of questionable viability would be exposed to the problems of extreme prematurity.

The role of pediatric cardiologists is expanding in the field of fetal cardiac interventions (FCIs). The FCI of early years was primarily for pharmacological therapy of arrhythmias, heart block, and heart failure. Then came the era of direct FCI with the advent of valvuloplasty and balloon atrial septostomy.^[12] All the above interventions were aimed toward improving fetal cardiac function, survival, and/or achieving a biventricular circulation to improve postnatal outcome. It is difficult to put forth guidelines in the above scenarios due to inability to conduct randomized control trials, uncertainty of the natural history of the disease, risk/benefit ratio of the intervention to both the mother and fetuses, etc. Especially in hypoplastic hearts, many fall in the gray zone between univentricular and biventricular circulations.^[12] Decision-making becomes even more difficult when you have a multiple gestation where the fetuses are discordant for the problem, as the nonaffected fetus in addition to the mother becomes an innocent bystander.

The management of such patients should always involve a multidisciplinary team. When it comes to counseling for/against an FCI, the team should understand the concepts of beneficence, autonomy, viability, and their ethical implications. In any event, should there arise a conflict between the mother and healthcare giver, it should be resolved through constant knowledge sharing and counseling, respecting the mother's autonomy and beliefs.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Bravo-Valenzuela NJ, Rocha LA, Machado Nardoza LM, Araujo Júnior E. Fetal cardiac arrhythmias: Current evidence. *Ann Pediatr Cardiol* 2018;11:148-63.
2. Czeszyńska MB, Wegrzynowski J, Czajkowski Z, Dawid G. Fetal and neonatal arrhythmia in one of the twins – A case history. *Acta Genet Med Gemellol (Roma)* 1998;47:197-200.
3. Tanawattanacharoen S, Uerpaiojkit B, Prechawat S, Manotaya S, Charoenvidhya D. Intrauterine therapy for fetal supraventricular tachycardia in a twin pregnancy. *J Obstet Gynaecol Res* 2005;31:94-7.
4. Jones LM, Garmel SH. Successful digoxin therapy of fetal supraventricular tachycardia in a triplet pregnancy. *Obstet Gynecol* 2001;98:921-3.
5. Zoeller BB. Treatment of fetal supraventricular tachycardia. *Curr Treat Options Cardiovasc Med* 2017;19:7.
6. McCullough LB, Chervenak FA. A critical analysis of the concept and discourse of 'unborn child'. *Am J Bioeth* 2008;8:34-9.
7. Kurjak A, Carrera JM, McCullough LB, Chervenak FA. The ethical concept of the fetus as a patient and the beginning of human life. *Period Biol* 2009;111:341-8.
8. Chervenak FA, McCullough LB. Ethical dimensions of the fetus as a patient. *Best Pract Res Clin Obstet Gynaecol* 2017;43:2-9.
9. American College of Obstetricians and Gynecologists; Society for Maternal-Fetal Medicine. Obstetric care consensus No. 6: Perivable Birth. *Obstet Gynecol* 2017;130:e187-99.
10. Park K, editor. Demography and family planning. Park's Textbook of Preventive and Social Medicine. 25th ed. Jabalpur, Pune: M/s Banarsidas Bhanot; 2019. p. 530-71.
11. Nimbalkar SM, Bansal SC. Perivable birth – The ethical conundrum. *Indian Pediatr* 2019;56:13-7.
12. Yuan SM. Fetal cardiac interventions. *Pediatr Neonatol* 2015;56:81-7.