African Journal of FetoMaternal Medicine

Review Article

Foetal Reduction in Plural Pregnancies

Olufemi Adebari Oloyede[1], Mkpe Abbey[2]

[1]Maternal Fetal Medicine Unit, Department of Obstetrics and Gynaecology, Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State
[2] College of Medical Sciences, Faculty of Clinical Sciences, Department of Obstetrics and Gynaecology, Rivers State University Teaching Hospital, Port Harcourt, Rivers State, Nigeria

ABSTRACT

Foetal reduction began as selective feticide in the late 70's to manage discordant fetal anomaly in twins and later introduced as multifetal pregnancy reduction for the management of higher order pregnancies following use of assisted reproductive techniques and ovulation induction drugs in the 80's. This review involved systematic search on two bibliographic databases: MEDLINE and PUBMED and supplemented with grey literature searches to extract updates on fetal reduction. The indications have evolved from strictly medical, to accommodate couples' desires, thus contributing to the increasing utilization, especially multifetal pregnancy reduction in higher order pregnancies. Pre-procedure fetal assessment and intra-procedure guidance rely principally on ultrasound scan. The technique of transabdominal intrathoracal or intracardiac injection of KCl between 8-10 weeks is mostly used because it is least associated with complications. It is not recommended < 8 weeks because of technical difficulty of accessing the distant small sized embryo or >2nd trimester because of the higher miscarriage risk. Transvaginal aspiration or needling techniques before 8 weeks have higher risk of infection, bleeding and miscarriage. A third of procedures experience mild spotting while procedure-related miscarriage was reported in 4-33% as the most distressing complication. Reduction to twin is the goal in higher order pregnancy and to singleton in twin pregnancy. Ethical challenge is evolving in line with the changing perspective of fetal reduction from a matter of 'life or death' to 'quality of life'.

KEY WORDS: Fetal reduction, Embryo reduction, Plural pregnancy, Higher order pregnancy, Selective feticide, Multifetal pregnancy reduction, Ultrasound scan.

Historical Perspectives

Fetal reduction (FR) refers to the procedure or process of terminating a viable embryo or fetus to prolong pregnancy duration, reduce severity of preterm delivery and its complications and/or to avoid the delivery of a baby with congenital anomaly. The term selective feticide (SF) is used when it is performed for a discordant fetal anomaly (DFA) in twin pregnancy or rarely in higher order pregnancies (HOP)[1, 2]. The procedure is multifetal pregnancy reduction (MFPR) when ≥ 1 fetus(es) in a HOP are reduced[3]. Embryo is acceptable name when reduction is performed at gestational age (GA) < 8 weeks[3,4]. Other terminologies of historical interest are selective reduction, selective birth, selective abortion, embryo reduction,

Correspondence:
Olufemi Adebari Oloyede
Maternal Fetal Medicine Unit, Department of Obstetrics and Gynaecology, Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State

pregnancy termination, and pregnancy reduction[5, 6].

Selective feticide was the earliest procedure in history reportedly carried out in twin pregnancies discordant for Hurler syndrome (1976) and Down syndrome (1978)[7,8.] The introduction of MFPR was a clinical response in the 1980s to the rising incidence and severity of preterm deliveries and its complications of prematurity following HOP mediated assisted conceptions [9, 10, 11]. The earliest series were from Europe (1986) and USA (1988 – 1990)[9, 10, 11, 12, 13]. Selective feticide for DFA was reported in Africa in 2019[2]. Some unpublished data have suggested rising number of MFPR procedures mainly for HOP in Nigeria.

The procedure indications, steps, fetal and maternal outcomes have continued to witness positive evolution since it was introduced. Transabdominal procedures have gained acceptance over trans-vaginal procedures, while potassium chloride (KCl) is now the most popular drugs for either intrathoracic or intracardiac injection[14, 15]. Better ultrasound scan technology, improved surgical skill and referral collaboration between centres collectively resulted in better procedure outcomes in developing countries[14].

Indications for Fetal Reduction

The indications for FR continue to expand due to better understanding of the mechanism of placentation in plural pregnancy, introduction of newer cord occlusion techniques, improved surgical skill, significantly reducing rates of complications and changing perception of FR from being a matter of 'life and death' to issues of quality of life[14, 16]. The indications can be broadly divided into four groups: Discordant Fetal Anomaly: Discordant fetal anomaly is the earliest and only indication for the FR in discordant anomalous twin pregnancy. DFA occurs in 9% of twins[3]. The anomalies must be lethal and have adverse effect on long term survival and quality of life to be regarded as an acceptable indication. Few examples are such structural or chromosomal anomalies are Hurler syndrome, Down syndrome with ventricular septal defect, thanatophoric dysplasia, holoprocencephaly and severe ventriculomegally[2, 7, 8, 14, 17, 18]. Higher Order Pregnancy: Higher order pregnancy is the leading indication for FR because of the high frequency of preterm delivery. The aim is to reduce the fetuses in pregnancy to a number that will have the minimum risk of perinatal morbidity and mortality. The rising frequency of preterm delivery which is directly related to increasing utilization of ART and ovulation induction is gradually decreasing due to better control and management of ART techniques[14]. The risk of preterm delivery correlates with the number of fetuses[4, 15].

Severe Maternal Medical Disorder in Pregnancy: Plural pregnancy increases the burden of fetal and maternal complications in pregnant women with sickle cell disease (SCD)[19, 20]. The successful application of FR in few cases has encouraged its incorporation into standard multidisciplinary team approach in the management of women with this disorder[19]. History of severe preeclampsia was the indication for embryo reduction prior to the availability of more effective methods of managing patients with this condition[4]. Parental/Social Choice: This has gradually become an indication for FR. It could be requested for the purpose of selecting a preferred gender[21]. The burden of economic and psychological demands of multiple births which could lead to matrimonial breakup is another justification for FR in some families who have $\geq$ 4 fetuses in a HOP[4,5]. Similarly, about 25% of women in a new relationship or with existing children had FR to 1 or 2 additional children because of advance age and socio-economic circumstances[22]. Gay partners could request for FR in a surrogate with triplet to twin in with each fetus is derived from different eggs[14]. Congenital Uterine Disorder: Congenital anomalies of the uterus predispose plural pregnancy to a high risk of late abortion and preterm delivery. Common anomalies that have been managed with fetal reduction include uterine hypoplasia, septate uterus and incompetent cervix that were documented with hysterosalpingography[4].

Principles in Fetal Reduction

The overall success of FR is promoted by adherence to certain basic principles.

Counseling

Counseling deals with the clinical, psychosocial, sociological, and ethical issues associated with FR[3]. It discusses the indication(s) for the procedure, management options and consent for the procedure. The counseling around indication must address the nature, severity and long-term

implications of the disorder. The alternative path to non-reduction such as late abortions or preterm delivery with its attendant health and non-health related challenges must be emphasized.

The number of embryo left after reduction is oftentimes a product of consensus agreement between physician (technical reasons) and the couple (personal wish). Monofetal pregnancy has the highest chance of being carried to term, but it is not an ideal target in HOP because of the risk of vanishing fetus and total pregnancy loss. Traditional practice is to reduce to two embryos or fetuses in order to enjoy the advantage of additional weeks and having singleton, if one of the fetuses vanishes[4]. Recent data suggest that FR to singleton do better than twins and should be considered in IVF conception when the woman is above 41 years and for social reasons[23].

Foetal Assessment before Fetal Reduction

Fetal assessment is done to evaluate the status of each fetus and determine the most appropriate fetus for reduction. Ultrasounds scan is the main evaluation tool and further genetic testing will be based biological and obstetric profile of the woman, mode of conception and facilities available.

The ultrasound scan confirms number of gestational sacs and fetuses, viability, gestational ages, placentation and chorionicity, as well as presence of soft aneuploidy markers[4]. The GS mapping to determine their relative closeness to the fundus or the cervix is a critical determinant of the technical ease of the procedure. Gestational sac(s) closest to the uterine fundus are best accessed through transabdominal approach and those closest to the internal os by transvaginal approach[3]. Screening for the risk of aneuploidy is reliably done using differences in crown rump lengths (CRL), foetal heart rates (FHR) measurements, absence/presence of nasal bone (NB), nuchal translucency (NT) values and ductus venosus assessment[2, 4]. These soft markers have been validated for use between 11-13^{+6} weeks, which makes them non-useful for FR before 11 weeks. The screening option before 11 weeks is CRL and FHR differences. Fetuses with lowest CRL measurements end up as vanishing fetus in about 79% of fetuses, compared with about 8% of fetuses with appropriate parameters[3].

Invasive prenatal testing using chorionic villous sampling (CVS) on day 1 for FISH analyses overnight to rule out common chromosomes 13, 18, 21, X, and Y, followed by FR on day 2 as an alternative to ultrasound scan screening is no longer routinely done[22]. Rather QF PCR for common chromosomes and FR, on same day is preferred. Majority of units utilize ultrasound scan screening with invasive testing only on indication. The ultrasound has the added advantage of being able to diagnose major congenital anomaly. In developing countries, the most pragmatic recommendation is ultrasound scan screening and FR a day case, like a previous report[2, 14, 24]. The main criteria for FR are major congenital defect or aneuploidy high risk.

Techniques for Fetal Reduction: Methods, Approach and Considerations

The technique of fetal reduction consists of a combination of method and approach used depending on the gestational age, indication and skill of the operator. Transvaginal techniques were introduced before transabdominal techniques. The latter is however the mostly used technique for the procedure[2, 4, 14]. Two main methods have been described, mechanical and medical. The mechanical methods include all manipulations done to cause demise of the embryo or fetus without the use of drugs such as aspiration and needling, while the medical method strictly refers to the use of any agent to cause cardiac asystole such as potassium chloride, calcium gluconate, formaldehyde, room air and saline.

Transabdominal techniques can be used in all gestational ages but ostly recommended after 10 weeks, while trans-vaginal techniques are recommended before 10 weeks[2, 3, 4]. Transvaginal needling or aspiration is generally performed between 8-10 weeks, with higher complication rates in aspiration compared with needling[25]. Between 8-10 weeks, the fetal size and distance from abdominal wall make transabdominal technique more difficult and less attractive. Fetal reduction is generally not recommended before 8 weeks because of the spontaneous fetal resolution. Between 16-43% of multiple pregnancies resolves spontaneously with > 90% of them occurring < 7 weeks, 10% at 8-12 weeks and none > 13 weeks (3, 25). The implication of these findings is that FR

may be performed between 8-10 weeks with minimal technical difficulty (3)

Aspiration and needling methods are mostly performed transvaginally, while drugs are more common administered into the intrathoracal or intracardiac chambers through transabdominal approach. The earliest gestational age at which major fetal abnormalities are diagnosed makes transabdominal technique favoured for DFA and also for MFPR presenting after 11 weeks. The additional benefits of transabdominal technique are reduced risk of infection and bleeding, when compared with transvaginal technique[3]. In practice, mixed mechanical and medical methods are used. Routine amniotic fluid aspiration is not supported by literatures.

Preliminary Steps in Fetal Reduction

There are few steps and measures that are not universally adopted for FR. Administration of intravenous fluid have been recommended because it is believed to dilute and aids excretion of inadvertently cardiotoxic drugs. Antibiotics use could be pre-procedure or prophylaxis course. It is however used for most transvaginal procedures or transabdominal procedures where antisepsis measures are not guaranteed[3]. Local infiltration with xylocaine suffices in most cases, even though general anesthesia has been reported[2,3,4]. In anxious women, mild sedative provides relieve. Fetal reduction is performed under continuous real time ultrasound scan to ensure that the mother and fetuses are at minimal risk of unintended harm.

Transabdominal Fetal Reduction

The procedure begins with routine skin preparation using chlorhexidine and spirit before draping. About 10-20ml of 1% xylocaine is locally infiltrated into the abdominal wall layers down into the uterus, followed by gentle introduction of 18 to 22 echotip, stylet-filled needle under ultrasound scan guide into the amniotic cavity is the next step.[2, 3]. The needle should be firmly pushed into the fetal thorax, aiming at the cardiac chambers and a perception of "loss of resistance" with or without spontaneous reflux or free aspiration of blood after stylet removal will be an additional confirmation of appropriate placement of needle in the ventricles or thorax before injection of KCl (0.5-2ml/15%/2mEq/ml solution) to cause cardiac asystole[2,3, 4]. Non cardiotoxic agents such as air and normal saline have been described[12]. Intracranial KCl injection was reported to be an equally effective but easier technique between 12 and 18 weeks of gestation[15]. For needling procedures, the fetal thorax is repeatedly traumatized with the needle aiming at the heart. Different needle is used for different fetuses.

Transvaginal Fetal Reduction

Chlorhexidine and saline are two solutions used for vaginal cleansing during transvaginal procedure. The standard practice is to dilate the cervix to a maximum of 10mm to allow for the passage of aspiration needle (18cm x 30m follicular aspiration needle) or cannula under ultrasound scan guide[4, 12]. The recommended practice is to aspirate or "stab" the embryo closest to the cervical os and leave trophoblasts and membranes in situ[12]. Transvaginal technique is associated with higher rates of infection, bleeding, and miscarriages[10, 12, 13, 26].

Post Procedure Management

FR is a day case, and the women are stable for discharge within 2-3 hours[2, 3]. Post-procedure plan should include assessment of cardiac activity after 30min - 1hour, which has been reported in 5% of cases after 1hour and is an indication for repeat procedure[4]. Measures for early identification of spotting or bleeding per vaginam, leakage of amniotic fluid, onset of fever or contractions are ensured[2]. Anti-D prophylaxis in at-risk women is advised and follow-up ultrasonography after 1 week advised[2, 3].

Safety and Complication Issues associated with Fetal Reduction

Fetal reduction is not a risk-free procedure, but it is generally considered as a safe procedure in skilled hands. The safety and complication issues revolve around the precision that the procedure demands, and the side effects of cardio-toxic drugs used.

A. Bleeding per vaginam

Bleeding per vaginam is the commonest (33%) complication associated with FR (10). It commonly begins as mild spotting that resolves within 6-24 hours or may progress to clot bleeding lasting for days before spontaneous resolution. Management is conservative with bed rest, serial packed cell volume, ultrasound scan, and maternal vital signs monitoring

B. Procedure-Related Pregnancy Loss

Miscarriage is the most distressing complication of FR, with an unexplained wide prevalence range of 4-33%[10, 15, 16]. The early-onset miscarriage occurs within few days after the procedure and is often associated with mechanical methods because of trauma. Delayed-onset miscarriage presents several weeks after a procedure, presumably due to delayed infection, mostly with transvaginal procedures[4, 12]. The mean gestational age of delayed-onset miscarriage is 19.7 weeks, which is about 8-12 weeks after primary procedure[4]. Paradoxically, the assumed causal role of pathogens has not been bacteriologically or pathologically established[4]. The higher miscarriage rates in transvaginal procedures can be related to two main factors. First, cervical dilatation predisposes to weakness/incompetent cervix leadings to mid trimester miscarriage and second, direct inoculation of vaginal pathogens[4].

The volume of dead fetoplacental products correlate with the number of fetuses reduced and the volume of cytokines and prostaglandins released to elicit inflammatory response. The influence of no of fetuses on miscarriage rates is shown in table 1

Table 1: Risks of Multiple Pregnancies and Improvements with Fetal Reduction

Starting, number	Spontaneous loss rates (%)	Finishing, number	Reduction of risk of loss (%)
6+	90 – 99	2	90 – 10
5	75	2	50-7
4	25	2 1	25-4 25-7
3	15	2 1	15-3.5 15-4
2	8	1	8-2.5

Adapted from: Evans M, I, Andriole S, Britt D, W: Fetal Reduction: 25 Years' Experience. *Fetal Diagn Ther*. 2014; 35: 69-82. doi: 10.1159/000357974

Rare Complications

A normal fetus may be reduced inadvertently, suffers iatrogenic injury, and predispose the woman to developing coagulopathy.

Foetal Reduction in Triplet Pregnancy

Triplet to twin reduction to twin is believed to confers no clear-cut impact on the probability of preterm delivery and other perinatal morbidity and mortality[27]. Consequently, procedure is recommended when there is uterine malformation, cervical incompetence with history of premature delivery, coelosomy diagnosed in the first trimester and as management option in severe pre-eclampsia to avoid termination of pregnancy[4]. However, about 33% reduction in the risk of severe PTB and very low birth weight was independently at expense of a 25% increase in total pregnancy loss was observed[28]. Triplet to singleton reduction is being justified based on additional 2 weeks gain from 35.5 weeks for twins to 37.7 weeks in singleton[4, 28].

Foetal Reduction in Monochorionic Placentation

Intraplacental vascular anastomoses in monochorionic placentation predisposes to the risk of unintended transfer of cardiotoxic drugs to a normal fetus. Traditional measures to avoid this risk which involves use of less- or non-cardiotoxic agents such as saline or air has been replaced by vascular-occlusive techniques which permit selective reduction in monochorionic pregnancies in the presence of discordant anomalies or indeed MFPR in non-trichorionic triplets. These involve ultrasound-guided radiofrequency ablation and cord occlusion techniques such as ligation, coagulation or compression[18, 29].

Repeat Procedure

Majority of FR procedures are completed in one session[14]. Repeat of procedure may be safely scheduled after 1-2 weeks if it was technically difficult to achieve the target goal during a primary procedure in HOP $\geq$ 5 or immediately after return of cardiac activities[4].

Learning curve

The overall outcome of FR depends on the skill of the operator, which in-turn reflects the stage on the learning curve. Prior experience and skill in invasive fetal diagnostic procedure impact positively on attainment of skill and procedure safety. High procedure-related miscarriage rate of 30% was reported in the early phase of the learning curve[3].

Ethical Considerations in Fetal Reduction

Fetal reduction is ethically challenging, which us influenced by religion, culture and reproductive health laws[17]. The goal of FR to preferentially

conserve fetal lives is often viewed and treated as abortion that rather terminates fetal lives, by many laws.

Ethics deals with what is considered acceptable in terms of indications, fetal selection criteria, gestational age for intervention, and mode of conception[30]. Lethal fetal anomalies and severe life-compromising medical disorders are standard indications for FR, especially when requested by the physician[30, 31, 32]. Fetal reduction request from couples is largely viewed as ethically unacceptable. The accuracy of selection criteria that defines long term fetal prognosis is poor before 11 weeks when most FR is performed. The implication is that fetal selection is biased towards technical considerations such as location of gestational sac as against objective immediate and long term health criteria. The issue of fetal right is against inflicting pain on the fetus by any procedure, thus FR is generally advocated in first and es early as possible in second trimester.

Conclusion

Fetal reduction is an indispensable part of reproductive health choices that should be available to women based on well defined criteria. The safety and outcomes of the procedure has improved over the years. Future activities and researches should aim at standardizing transabdominal techniques because of the superior profiles over transvaginal techniques and possibility of reduction to singleton in order to gain additional gestational age towards term. Collaboration between units and countries should be encouraged.

References

1. Rustico MA, et al. Managing twins discordant for fetal anomaly. Prenat Diagn. 2005; 25(9):766–71. doi: 10.1002/pd.1260
2. Oloyede OA. Selective feticide for severe fetal abnormality in dichorionic twin. Gazz Med Ital - Arch Sci Med 2019; 178:711-4. DOI: 10.23736/S0393-3660.18.03909-8
3. Ibérico J. et al. Embryo reduction of multifetal pregnancies following assisted reproduction treatment: a modification of the transvaginal ultrasound-guided technique. Hum Reprod. 2000; 15(10): 2228-33. doi.org/10.1093/humrep/15.10.2228
4. ommergues M et al. Embryo reduction in multifetal pregnancies after infertility therapy: obstetrical risks and perinatal benefits are related to operative strategy. Fertil Steril.1991; 55(4): 805-11. doi.org/10.1016/S0015-0282(16)54252-6
5. Rorty M and Pinkerton JV. Elective Fetal Reduction: The Ultimate Elective Surgery. J. Contemp. Health L. & Pol'y. 1997: 13(1/7); 52-78
6. Salat-Baroux J, et al. Is there an Indication for Embryo Reduction?. Human Reprod. 1992; 7(1): 67-72
7. Aberg A, et al. Cardiac puncture of fetus with Hurler's disease avoiding abortion of unaffected co-twin. Lancet. 1978; 2(8097): 990-1. doi: 10.1016/s0140-6736(78)92550-3.
8. Thomas DK, Usha C. Selective birth in twin pregnancy with discordancy for Down's syndrome. N Engl J Med. 1981; 304: 1525-27. doi: 10.1056/NEJM198106183042505
9. Običan S, et al. Multifetal Pregnancy Reduction. Clin Obstet Gynecol. 2015; 58(3):574-84. doi: 10.1097/GRF.0000000000000119.
10. Berkowitz RL, et al. Selective reduction of multifetal pregnancies in the first trimester. N Engl J Med. 1988; 318:1043-47. doi: 10.1056/NEJM198804213181607
11. Evans MI, et al. Multiple Gestation: The role of multifetal pregnancy reduction and selective termination. Clinics in Perinatology. 1992; 19(2): 345-57. doi.org/10.1016/S0095-5108 (18)30459-7.
12. Dumez Y, Oury JF: Method for first trimester selective abortion in multiple pregnancy. Contrib Gynecol Obstet 1986; 15: 50–53
13. Wapner RJ, et al. Selective reduction of multifetal pregnancies. Lancet 1990; 335(8681): 90-3. doi.org/10.1016/0140-6736(90)90550-O.
14. Evans M, I, Andriole S, Britt D, W. Fetal Reduction: 25 Years' Experience. Fetal Diagn Ther. 2014; 35: 69-82. doi: 10.1159/000357974
15. Li R et al. Intracranial KCl injection – an alternative method for multifetal pregnancy reduction in the early second trimester. Fetal Diag Ther. 2013; 34: 26–30
16. Cohen AB, Hanft RS: Technology in American Health Care: Policy Direction for Effective Evaluation and Management. Ann Arbor, University of Michigan Press, 2004
17. Chima SC, Mamdoo F. Ethical and legal dilemmas around termination of pregnancy for severe fetal anomalies: A review of two African neonates presenting with ventriculomegaly and holoprosencephaly. Niger J Clin Pract. 2015;18: S31-S9
18. Vojtěch J, et al. Selective feticide in monochorionic twin pregnancies with discordant

fetal anomalies: management and outcome. Ceska Gynekol. 2017; 82(5):345-350
19. Masinde A, Gumodoka B, Im H. Sickle Cell Disease Complicated With Multiple Pregnancy: A Case Report. The Internet Journal of Gynecology and Obstetrics. 2009:13 (2).
20. Oteng-Ntim E et al. Sickle cell disease in pregnancy. Current Obstetrics & Gynaecology. 2006; 16: 353–360.
21. Evans MI et al. Evolution of gender preferences in multiple pregnancies. Prenat Diagn 2013; 33: 935–939
22. Rosner M et al. Detection of genetic abnormalities using CVS and FISH prior to fetal reduction in sonographically normal appearing fetuses. Prenat Diagn 2013; 33: 940–944
23. Evans MI et al. Fetal reduction from twins to a singleton: a reasonable consideration. Obstet Gynecol 2004; 104: 102– 109
24. Evans MI et al. Selective first trimester termination in octuplet and quadruplet pregnancies: clinical and ethical issues. Obstet Gynecol 1988; 71: 289–296
25. Bollen N. Embryo reduction in triplet pregnancies after assisted procreation: a comparative study. Fertil Steril. 1993; 60 (3): 504-9. https://doi.org/10.1016/S0015-0282(16)56168-8.
26. Dechaud H, et al. First-trimester multifetal pregnancy reduction: evaluation of technical aspects and risks from 2,756 cases in the literature. Fetal Diagn Ther. 1998; 13(5):261-5. doi: 10.1159/000020851. Leondires MP et al. Triplets: outcomes of expectant management versus multifetal reduction for 127 pregnancies. Am J Obstet Gynecol. 2000; 183(2):454-9. doi: 10.1067/mob.2000.105546
27. Antsaklis A, et al. Embryo reduction versus expectant management in triplet pregnancies. J Matern Fetal Neonatal Med. 2004; 16(4):219-22. doi: 10.1080/14767050400013826
28. Wimalasundera RC. Selective reduction and termination of multiple pregnancies. Semin Fetal Neonatal Med. 2010; 15(6):327-35. doi: 10.1016/j.siny.2010.08.002
29. Rorty MV, Pinkerton JV. Elective fetal reduction: the ultimate elective surgery. J Contemp Health Law Policy. 1996; 13(1):53-77.
30. Heuser CC, EllerAG, Byrne JL. Survey of physicians' approach to severe fetal anomalies. J Med Ethics 2012; 38: 391-5.
31. 32.Chervenak F, McCullough LB. Responsibly counselling women about the clinical management of pregnancies complicated by severe fetal anomalies. J Med Ethics 2012;38:397-8.