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REVIEW ARTICLE

Journal Watch

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Chorioamniotic membrane separation after fetoscopy in monochorionic twin pregnancies: incidence and impact on perinatal outcome. Ortiz JU, Eixarch E, Peguero A, Lobmaier SM, Bennasar M, Martinez JM, et al. Ultrasound Obstet Gynecol. 2015 Jul 3. doi:10.1002/uog.14936.

Twin-to-twin transfusion syndrome (TTTS) and selective intrauterine growth restriction (sIUGR) can complicate about 10 %–15 % and 10 % of all monochorionic (MC) twin pregnancies, respectively. Fetoscopic surgery is the only treatment option for TTTS and it may be indicated in selected cases of sIUGR. A relatively common incidental finding after fetoscopy is chorioamniotic membrane separation (CMS), a detachment of the amnion from the chorion layer that can be clearly identified by ultrasound. The aim of this study was to evaluate the incidence of CMS after fetoscopic procedures, laser photocoagulation of communicating vessels (SLPCV), or cord occlusion (CO), in complicated MC twins and its impact on pregnancy outcome.

A total of 338 consecutive cases were included during the study period. TTTS was diagnosed in 79.9 % and sIUGR in 20.1 % of cases. SLPCV was performed in 74.6 % (n = 252) of cases and CO in 25.4 % (n = 86). CMS was observed within one week after procedure in 20.7 % (n = 70) of cases, of which, 92.9 % (n = 65) occurred within 72 h after therapy.

Multivariate analysis showed that only gestational age (GA) at surgery was an independent predictor of the risk of CMS (adjusted $p < 0.001$). The best cut-off point to stratify risk for CMS was a gestational age of <18 weeks [OR 2.941 (1.640–5.275); $p < 0.001$]. Regarding perinatal outcomes, patients with CMS had a significantly higher rate of miscarriage (14.7 % vs. 7.1 %; $p = 0.049$), preterm premature rupture of membrane (PPROM) (43.1 % vs. 13.7 %; $p < 0.001$), and preterm delivery <32 weeks (53.4 vs. 26 %; $p < 0.001$). In addition, the CMS group showed a significantly lower median GA at delivery [31.1 (±7.4) vs. 35.1 (±5.1)] and a decrease in the proportion of cases with at least one twin alive.

This study provides evidence that postoperative CMS is associated with poorer pregnancy outcomes in patients undergoing fetoscopy due to an increase of miscarriage, PPROM, preterm delivery, and lower neonatal survival. Earlier gestational age at surgery is the only factor that seems to be associated with CMS.

Cell-free DNA analysis for noninvasive examination of trisomy. Norton ME, Jacobsson B, Swamy GK, Laurent LC, Ranzini AC, Brar H, et al. N Engl J Med. 2015 Apr 23;372(17):1589–97

Screening for fetal aneuploidy with the use of cell-free DNA (cfDNA) obtained from maternal plasma has been reported to have a detection rate for trisomy 21 (Down syndrome) of more than 99 %, with a false positive rate as low as 0.1 %. Although this information was based on several large studies, most of these studies have included only selected populations of high-risk women who were

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sampled before invasive testing and only limited data are available on the performance of cfDNA testing in the low risk for aneuploidy population.

In this blinded study, a hypothesis that cfDNA testing has better performance than combined first-trimester screening (nuchal translucency and biochemical analytes) in risk assessment for trisomy 21 in a low-risk population was tested prospectively. Out of 18,955 women who were enrolled, 15,841 were available for analysis. Area under the receiver operating characteristic (ROC) curve and area under curve (AUC) for trisomy 21 was 0.999 for cfDNA testing and 0.958 for combined screening ($p = 0.001$). cfDNA identified all 38 cases of trisomy 21 in this cohort, for a sensitivity of 100 % [95 % confidence interval (CI) 90.7–100], while standard screening identified only 30 of 38 cases as positive, with a sensitivity of 78.9 % (95 % CI 62.7–90.4; $p = 0.008$). The false positive rate for the cfDNA-testing group and the standard combined screening group was 0.06 % (95 % CI 0.03–0.11) and 5.4 % (95 % CI 5.1–5.8; $p < 0.001$), respectively. The positive predictive value was 80.9 % (95 % CI 66.7–90.9) for cfDNA testing and 3.4 % (95 % CI 2.3–4.8) for standard screening ($p < 0.001$).

In conclusion, the performance of cfDNA testing was superior to that of traditional first trimester screening for the detection of trisomy 21 in a routine prenatal population. cfDNA testing for trisomy 21 had higher sensitivity, a lower false positive rate, and higher positive predictive value than did standard screening with the measurement of nuchal translucency and biochemical analytes.

Inter-twin discrepancy in middle cerebral artery peak systolic velocity and pregnancy outcome in monochorionic diamniotic twin pregnancies. Stagnati V, Pagani G, Fichera A, Prefumo F. Ultrasound Obstet Gynecol. 2015 Jul 14. doi:10.1002/uog.14944.

Doppler assessment of the middle cerebral artery-peak systolic velocity (MCA-PSV) changed the standard of care in the management of pregnancies at risk of fetal anemia in the last decade. In monochorionic twin pregnancies, MCA-PSV is used to diagnose fetal anemia secondary to twin–twin transfusion syndrome (TTTS) or to twin anemia-polycythemia sequence (TAPS); but no studies in the current literature reported inter-twin discrepancy in MCA-PSV as a predictor of pregnancy outcome in monochorionic twin pregnancies.

The aim of this study was to determine if a discrepancy in MCA-PSV in otherwise uncomplicated monochorionic twin pregnancies can be a predictor of adverse pregnancy outcome, defined as selective intrauterine growth restriction (sIUGR), defined as the detection of IUGR in only one of the twin, at birth or birth-weight (BW) discordance (difference in birth weight expressed as a % of the larger twin).

Out of 172 monochorionic diamniotic twin pregnancies (MCDA), 136 were included in the analysis. At birth, 12 (8.8 %) pregnancies were complicated by BW discordance ≥25 % (BW-25), 30 (22.1 %) by selective intrauterine growth restriction (sIUGR) and 11 pregnancies had both BW-25 and sIUGR. None of the twin pregnancies included in the analysis showed signs of sIUGR or inter-twin size discrepancy (ITGD), nor Doppler abnormalities at the 28 weeks' scan or before.

MCA-PSV discrepancy, defined as the absolute value of the difference in MCA-PSV between twins expressed in MoMs, showed an AUC of 0.73 (95 % CI 0.62–0.85) and 0.79 (95 % CI 0.65–0.93) for sIUGR and BW-25, respectively. The optimal cut off point was 0.30 MoM for both sIUGR (sensitivity 70 %; specificity 69 %; PPV 38.9 %; NPV 89.0 %) and BW-25 (sensitivity 83 %; specificity 72 %; PPV 81.5 %; NPV 97.6 %). After adjustment for ITGD at 28 weeks and parity, logistic regression analysis showed a significant association between MCA-PSV discrepancy, nulliparity, and sIUGR.

These findings suggest that inter-twin MCA-PSV discrepancy in the third trimester is independently associated with both sIUGR at birth and BW discordance. These data could link late onset sIUGR and ITGD to an unbalanced flow though placental vascular anastomoses. Moreover, the high NPV for both sIUGR at birth and BW discordance may have a role in clinical practice in order to identify a group of monochorionic pregnancies manageable as at lower risk, allowing a less-intensive ultrasound monitoring in the third trimester.