Perinatal outcome of fetoscopic laser surgery for twin-to-twin transfusion syndrome in early gestation

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Objective
To compare the perinatal outcome of early laser surgery for twin-to-twin transfusion syndrome (TTTS) performed before 17 weeks of gestation with procedures performed later in pregnancy.

Methods
A retrospective observational cohort study of monochorionic twin pregnancies, complicated by TTTS, treated before 17+0 weeks of gestation during the last ten years in two European centers with expertise in TTTS treatment. The control group consisted of randomly selected patients undergoing fetoscopic laser therapy between 17+0-26+0 week of gestational age during the same period. Only patients with a primary intention of laser therapy were included in the study. Other exclusion criteria were severe congenital malformations, chromosomal abnormalities and triplets complicated by TTTS. Selective fetoscopic laser coagulation of placental anastomoses was performed using a 2.0 mm endoscope through an operative sheath of 10 French, while a 7-8 French sheath was mainly used below 16 weeks gestation. All procedures were performed percutaneously in local anesthesia and amnioinfusion was usually used.

Results
Overall, 319 MC pregnancies were included in the analysis. The mean GA at treatment was 19+0 w (14-25+6), with a mean GA at delivery of 32+6 w (24-41+2). Binomial logistic regression showed significant association between GA at treatment and the occurrence of miscarriage (p=0.03; OR 0.83) and PPROM (p=0.003;OR 1.16). The early group consisted in 70 MCDA twins operated before 17+0 weeks of gestation. Results were compared to patients treated between 17 and 26 weeks gestation and are presented in Table 1.

| GA at surgery: mean (SD)* | TTS Stage n (%): I 12 (2.9) II 21 (30) III 112 (45) IV 0 6 (2.4) Surgery time (min) mean;range* | Pregnancy loss < 24 weeks or TOP n(%): 10/68 (14.7) 22/247 (8.9) PROM¥ 33/67 (49.2) 83/234 (35.5) Mean GA at birth 33+0 (24-41+2) 32. 7 (24-41+2) Delivery < 28; n(%): 8/59 (13.5) 21/225 (9.3) Overall Survivors at birth At least 1 60 (85.7) 223/247 (90.3%) 2¥ 39 (55.7) 175/247 (70.9) 1 21 (30) 48/247 (19.4%) 0 10 (14.3) 24/247 (9.7%) * p<0.05 (t-student); ¥ p<0.05 (X² test).

Conclusion
Early fetoscopic laser surgery is feasible, although associated to an increased rate of pregnancy loss and P-PROM. In our series, procedures performed before 17+0 weeks of gestation showed a significant increased risk of P-PROM and lower rates of double fetal survival with a non-significant trend for a higher rate of very-preterm delivery before 28 weeks gestation, when compared to later procedures.