

[EP09.13] Predicting Dual Survival After Fetoscopic Laser Photocoagulation Therapy in Twin-to-Twin Transfusion Syndrome: Development of a New Model

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Objective

To develop a prediction model for dual twin survival after fetoscopic laser photocoagulation (FLPC) in monochorionic diamniotic pregnancies complicated by twin-to-twin transfusion syndrome (TTTS).

Methods

We conducted a retrospective cohort study of TTTS cases treated with FLPC between 16 and 26 weeks at a single tertiary center (2006–2025). Demographic and sonographic variables at diagnosis were collected. Four predictive models were evaluated using logistic regression, random forest, XGBoost, and support vector machine algorithms. Model performance was assessed using repeated stratified 70/30 train–test splits and area under the receiver operating characteristic curve (AUC).

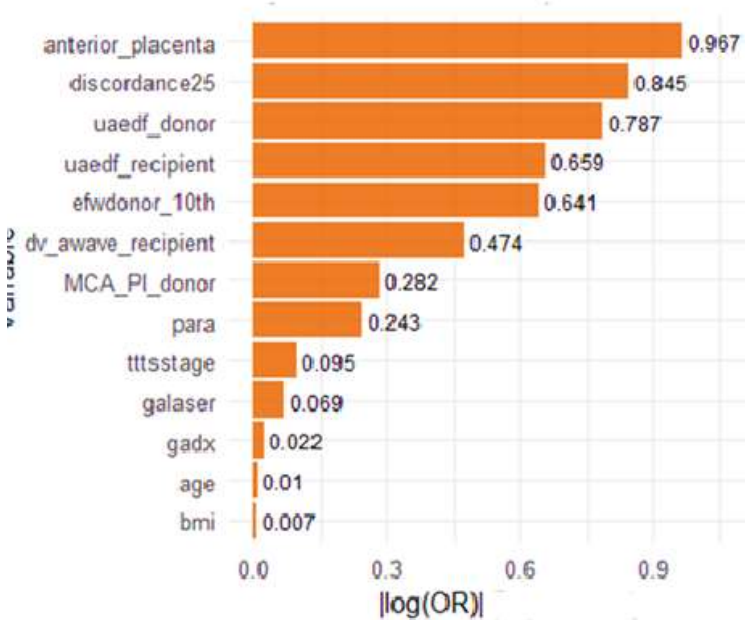
Results

A total of 236 pregnancies were included. Selective reduction by radiofrequency ablation occurred in 11/236 (4.6%), and 13/236 (5.5%) pregnancies were terminated due to severe neurological sequelae after FLPC or intrauterine demise of one twin. After excluding these

cases, 212 pregnancies were analyzed: 136 (64.2%) achieved dual twin survival at birth, while 76 (35.8%) had one or no survivors. Demographic characteristics were similar between groups. Significant differences were observed in donor estimated fetal weight, placental location, and intertwin growth discordance. Among the tested models, logistic regression demonstrated the best performance for predicting 30-day dual survival (AUC = 0.75). The most influential predictors were anterior placental location, donor umbilical artery end-diastolic flow, intertwin growth discordance >25%, absent a-wave in the recipient ductus venosus, and donor estimated fetal weight <10th percentile.

Conclusions

A prediction model based on readily available prenatal ultrasound parameters can predict dual twin survival after FLPC for TTTS and may support individualized prenatal counseling.



Relative Contribution of Candidate Predictors to the Prediction Model