Radiofrequency ablation for selective fetal reduction in complicated Monochorionic twin pregnancies: Our experience with single tine RF electrode

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Objective
Objective: Monochorionic (MC) twin pregnancies carry unique challenges since 25% of them can present with twin-twin transfusion syndrome (TTTS), selective fetal growth restriction (s-FGR), Twin reversed arterial perfusion sequence (TRAP), or twin anemia-polycythemia sequence (TAPS). Selective feticide is an accepted method to improve the outcomes in complicated MC twins where the prognosis for one of the twins is deemed poor. Selective cord occlusion can be performed by one of the following techniques: Radiofrequency ablation technique or Bipolar cord occlusion or Interstitial Laser technique. We aimed to determine the efficacy and safety of single tine RFA needle for selective fetal reduction in complicated Monochorionic twin pregnancies.

Methods
Materials and Methods: Multicentric retrospective case analysis from January 2018 through September 2021. We describe a case series of 18 monochorionic pregnancies undergoing selective fetal reduction using single tine radiofrequency electrode. All cases were done under local anaesthesia by a single operator. Briefly, the technique involved placement of RF electrode under ultrasound guidance into the fetal abdomen close to the intrafetal portion of the umbilical cord and increasing the wattage gradually till the tine temperature reached 85 - 90 degrees and maintained at that temperature for 5 minutes. A subsequent cycle is applied where necessary after a cooling time of 3 minutes. The intraoperative details and perinatal outcome were analyzed.

Results
Results: There were totally 18 cases (11 cases of selective fetal growth restriction, 3 cases of TTTS, one case of TRAP, one case of MCTA Triplets, 2 cases of discordant anomalies) of complicated monochorionic twins. Technical success rate was 94% (17/18). Technical failure to occlude the cord occurred in a case of TRAP. Maximum cycles required in any one case was 3 (in 3 cases) and one cycle only required in five cases. The mean gestational age was 19 weeks (16 - 22). The most common reason for performing RFA was selective fetal growth restriction followed by TTTS and discordant anomaly. Amnioreduction was done in 2 cases. Out of 18 cases, 15 resulted in livebirth (83%), 2 procedure related miscarriage (11%), 1 termination of pregnancy. In one case there was intraoperative bleeding from transplacental entry, which stopped spontaneously with no evidence of significant anemia in the co-twin. Co-twin damage rate was 5% (1/18).

Conclusion
Rates of technical success, live birth, co-twin damage and procedure related miscarriage of single tine RF electrode are all comparable to the rates reported for multi-tine electrode in published literature. Single tine electrode has the advantages of technical simplicity, smaller girth (17G vs 15G) and better tip visualization compared to multi-tine electrode. In low throughput setups, it is also a cheaper option.