Objectives: The optimal surgical solution for the correction of complex forms of TGA with VSD and LVOTO is discussed controversially. Long-term outcome of the most widely used Rastelli procedure is unsatisfactory while experience with newer techniques such as the modified Nikaidoh procedure is still comparably limited. We present our single center experience with different surgical approaches to biventricular outflow tract reconstruction.

Methods: From 2000-2013, 42 patients with TGA, VSD and LVOTO have been operated in our institution. Modifications of the Nikaidoh procedure (aortic translocation n=15, en bloc rotation n=4, double switch with Senning procedure n=2), the Rastelli procedure (n=13) and arterial switch (ASO) with LVOTO relief (n=8) were performed. Median age at operation was 9.5 months, median weight 8.7 kg. Sufficient pulmonary valve (PV) diameter with Z-score >-2 was present in 16 patients, in 10 of them the entire PV or PV leaflets could be preserved (8 ASO, 2 Nikaidoh).

Results: Median follow-up was 2 years (range 0.04-12.5). There were 3 early deaths (7% early mortality, Nikaidoh n=2, ASO n=1) and 2 late deaths (5% late mortality, Rastelli n=1, Nikaidoh n=1). On discharge, good cardiac function and outflow tract performance was observed. All autografts after modified Nikaidoh remained intact during follow up. Reoperation for LVOT reobstruction was required in one Rastelli patient while no LVOT reoperations were necessary after Nikaidoh or ASO. Freedom from significant reobstruction of the RVOT (dp >50mmH) at 5 years was 100% for ASO, 78% for Nikaidoh and 39% for Rastelli, respectively. Subsequent RVOT reoperation was necessary in 2 Nikaidoh patients (10%) and 3 Rastelli patients (23%).

Conclusions: All surgical approaches to this complex lesion offer good early functional outcome. Midterm results of the Nikaidoh procedure are superior to the Rastelli procedure, though long-term results have to be evaluated. Inevitable conduit failure remains a major concern and cause of reoperation in both techniques. En bloc rotation preserves PV growth potential and may reduce need for RVOT reoperation. Given the favorable reoperation rates, the performance of ASO with LVOTO relief or en bloc rotation should be considered in cases with PV Z-Scores < -2.