Introduction: A 14-year-old boy presented with atrial fibrillation (AF) with rapid ventricular rate, discovered during a school physical. Further evaluation included an electrocardiogram showing AF without ventricular preexcitation. An echocardiogram demonstrated preserved left ventricular function and mild left atrial enlargement. CT identified four normal pulmonary veins (PVs) and a persistent left subclavian vein which drained into a dilated coronary sinus. Laboratory parameters revealed normal electrolytes, thyroid function, and hemogram. Genetic studies identified a heterogeneous mutation of the sodium channel (SCN5A) with unknown significance. For two-years he had multiple cardioversions on various antiarrhythmic drugs (AADs), including: sotalol, propafenone, mexiletine, and dronedarone. Each cardioversion was followed by a short duration of sinus rhythm, lasting only hours. Also, rate control with beta- and calcium-blockers were unsuccessful. In January 2019, he underwent an EP study demonstrating dual AV node pathways without inducible AVNRT. Also, there was no conduction via an accessory pathway and no inducible macro reentrant atrial arrhythmias. After successful transseptal puncture, all four PVs were isolated in a wide circumferential manner using a 28-mm cryoballoon (CB) and 15-mm Achieve mapping catheter (Medtronic, Inc.). During ablation, AF spontaneously began with initiation of ablation and terminated after ablation was completed. He was observed overnight and remained in sinus rhythm. The patient was discharged on warfarin, but AADs were terminated. Later, warfarin was converted to apixaban.

Methods: N/A

Result: N/A

Conclusion: CB ablation has proven to be effective in achieving PV isolation (PVI) in adults with paroxysmal AF. This case demonstrated a safe and successful PVI using the second-generation cryoballoon in a young patient with persistent AF. To our knowledge, there is limited experience in young people, and this maybe the first reporting of the CB to isolate PVs in a child with persistent AF.