

Creation of Fontan Fenestration and Atrial Septal Defect with NRG RF Powered Transseptal Needle

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Introduction:

In this study, we present the results of NRG Transseptal Needle application for the transseptal puncture (TSP) in 2 patients and in one patient to create Fontan fenestration.

Case 1:

The results of cardiac catheterization of a 14 years-old child diagnosed with PH and glukogen storage disease type 1a were as pulmonary arterial pressure (PAP):118/48 mmHg, mean:69 mmHg, Rp:38 U/m² and Rp/Rs:92%. Because of syncope development TSP was applied. 10W (2 second) radiofrequency energy was given with NRG Baylis Transseptal Needle (NRG-71-C1). After the application of TSP, septostomy dilation was performed with increasing balloon diameters. Balloon dilation was terminated after observation of a 10% drop of arterial oxygen saturation (SaO₂).

Case 2:

Cardiac catheterization was performed in a 12 years-old girl diagnosed with transcatheter closed patent ductus arteriosus and Eisenmenger syndrome. PAP was 106/51 mm Hg, mean 77 mmHg, Rp 21.5 U/m², Rp/Rs %69. Despite combined treatment, symptoms were increased thus TSP was applied similarly to the first patient. However, after the radiofrequency energy was given 2 times to cross into the left atrium. SaO₂ fell from 98% to 90%.

Case 3:

A 27 years-old male patient with Fontan operation due to tricuspid atresia and 4 years ago lateral tunnel Fontan conversions was made and fenestration was opened surgically. Due to closure of fenestration, protein losing enteropathy, and syncope transcatheter Fontan fenestration was created with NRG Transseptal Needle. SaO₂ fell from 89% to 80%.

Discussion:

Radiofrequency has been used to create an ASD and in the Fontan palliation to create a fenestration. The NRG Transseptal Needle (NRG, Baylis Medical Company Inc.) has potential advantages over conventional needle. It requires little mechanical pressure, which might reduce the trauma of sudden advancement of the posterior left atrium through the interatrial septum as the needle crosses.

Conclusions:

In few studies this device has been used to create the Fontan fenestration and no adequate data are available using this device for purpose of the TSP in patients with PH. However, the use of the device to provide control over the puncture and the decreasing the risk of arrhythmia, may be useful in these patients.