Transcatheter pulmonary valve replacement in congenital heart disease – a nursing perspective

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Certain congenital heart defects require surgical reconstruction of the right ventricular outflow tract (RVOT). Such anomalies, present in about 20% of children with congenital heart disease, include Tetralogy of Fallot, pulmonary atresia with or without ventricular septal defect, truncus arteriosus, transposition of the great arteries, and double outlet right ventricle[1]. Over time, surgically implanted bioprostheses and valves undergo degenerative and calcific changes, which commonly lead to pulmonary stenosis or pulmonary regurgitation, and consequently to the need for reintervention[2]. Until the year 2000, surgical replacement of the pulmonary valve was considered the gold standard of treatment. However, after the first successful transcatheter implantation performed by Bonhoeffer *et al,* pulmonary valve replacement, whenever indicated, began to be approached via the transcatheter or percutaneous route[2,3]. Currently, the three most commonly used valves are the Melody®, Edwards SAPIEN™, and Harmony® valves, with the Melody valve being used in Croatia.

At the University Hospital Centre Zagreb, since 2019, when the first procedure was performed, 16 pulmonary valves have been implanted using the transcatheter approach, while more than 10,000 such procedures have been performed worldwide[2,3]. Before the procedure, the patient undergoes a comprehensive noninvasive and invasive cardiologic evaluation including electrocardiogram, echocardiography, chest X-ray, CT, MRI, coronary angiography, right heart catheterization, and laboratory blood tests. The procedure itself requires teamwork involving interventional cardiologists, anesthesiologists, radiology technicians, and nurses. The nurse's role includes psychological and physical preparation of the patient, preparation of instruments and equipment, monitoring of the patient during and after implantation, recognizing changes in the patient's condition, and promptly informing the physician.

Transcatheter pulmonary valve replacement represents a significant advancement in the treatment of patients with congenital heart disease and RVOT dysfunction. Its minimally invasive nature, reduced risk of complications, and faster recovery emphasize the importance of expertise, skill, precision, and empathy among team members. The nurse's knowledge and competencies in peri-procedural and post-procedural care are crucial for ensuring patient safety and a successful recovery.

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LITERATURE

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