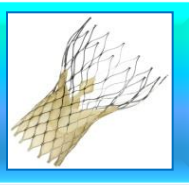
Nursing care after Transcatheter Aortic Valve Implantation with the Medtronic CoreValve Revalving® system

MC. Erpicum[1], MA. Radermecker[1], JO. Defraigne[1], V. Legrand[1]
(1) University Hospital of Liege, Belgium



Background: Transcatheter aortic valve implantation (TAVI) is increasingly performed and represents a relatively safe alternative treatment for high risk patients denied to surgical aortic valve replacement. The risks, complications and results of TAVI are widely described. The nursing cares required after this procedure are poorly described, although this could play a key role in the evolution of such frailty patients. TAVI is performed at the University Hospital of Liege since July 2008. We aim to describe the nursing cares required after TAVI and to determine which aspects of the management could be optimized to improve the results of the procedure.

Methods: TAVI has been performed using the Medtronic CoreValve Revalving® system in 46 consecutive patients. Empiric management based on nursing management applied for patients undergoing percutaneous vascular intervention and the awareness of an increased risk of auriculo-ventricular block (AVB) was applied for the 25 first cases. Based on this experience and the literature, we have identified common patient risks and needs after TAVI. Then, we have proposed a nursing care plan to our hospital intensive care unit nursing staff. This plan has been updated based on our clinical experience and analysis of clinical data.

Results: The nursing care after TAVI focused on the risk of conduction deficit by compression of the Hiss-Purkinje fibers and on the risk of cardiac or vascular lesions associated to bleedings. An aortic regurgitation is regularly present in the first days and can be influenced by the hemodynamic management. The prevention of infection, contrast induced nephropathy and autonomy loss are essential as well as the detection of embolism and contrast anaphylactic reaction. Events that occurred after TAVI were adequately anticipated by the nursing care plan. However, modifications have been made in the specific management of conduction disturbances, the prevention of secondary bleeding and infection in order to improve the results. Recommendations have been made for the prevention of contrast induced nephropathy and autonomy loss.

Conduction Deficit

- Temporary pacing lead for min. 24-48h advanced by femoral access, bridge to pacemaker in case of AVB
- ECG monitoring

One case of ventricular perforation by the temporary pacing lead
Two cases of « late » AVB
- After 72 hours without previous conduction deficit
- After 5 days with partial left bundle branch block at the 2nd day

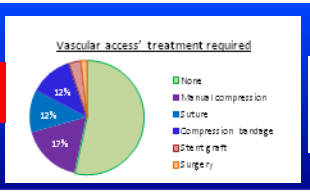
✓ Use of **balloon tipped electrode** in order to reduce the risk of perforation
✓ When adequate pacing is no longer effective, the lead placed at the time of the procedure is replaced by **jugular access**
✓ The temporary pacing lead should be removed after **72 hours** in absence of conduction deficit
✓ The patient should hold a ECG monitoring **until discharge** in case of partial conduction deficit not supplied by pacing

Cardiac Lesion

- Arterial pressure and cardiac frequency monitoring
- Respiratory and oxymetry monitoring
- Chest pain

Vascular Lesion

- Manual compression, compression bandage or suture are eventually used in adjunction or instead of a closure device



✓ A **compression bandage** is systematically adjuncted at the femoral vascular access site to the closure device used

Bleeding

- Hemogram, coagulation
- Hemodynamic parameters
- Puncture points
- Limbs' immobilisation for min. 6h
- General health
- Pain

Bleedings requiring manual compression, suture or compression bandage occured:
- In 41% of the cases
- In the first two days after TAVI for 89%

Aortic Regurgitation

- Hemodynamic and respiratory parameters
- Pain & discomfort
- Fluid balance

Infection

- Asepsis rules
- Temperature
- Prophylactic antibiotherapy
- White cells, Fibrinogen, CRP
- Systematic bacteriologic screening

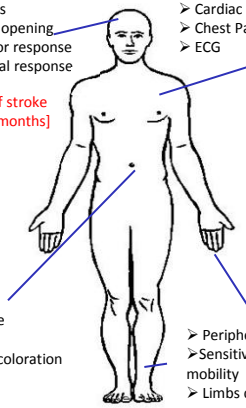
Therapeutic antibiotherapy needed in 37% of the cases

✓ Environment's adaptation with development of an **hybrid room** with laminar flux according with ISO 7 norms
✓ All intervening team complied with **hygiene and asepsis rules** in force in an operating theatre

Embolism

- Pupils
- Eyes opening
- Motor response
- Verbal response
- Cardiac enzymes
- Chest Pain
- ECG

6% of stroke [0-8 months]



- Lactate
- Pain
- Urine coloration
- Peripheral pulses
- Sensitivity and mobility
- Limbs coloration

Contrast Induced Nephropathy

- Hydratation
- Urine output
- Creatinin
- Ionogram
- Fluid balance
- Urea

4% of acute kidney injury after inadequate fluid management in a context of stroke and disorientation

✓ Patient's encouragement to **rehydrate**
✓ **Environment's adaptation** to the loss of autonomy

Contrast Anaphylactic Reaction

- Anamnesis
- Cutaneous observation

Autonomy Loss

- Nursing anamnesis
- Stimulation
- Active mobilisation
- Early discharge from ICU

2 cases of major loss of autonomy following prolonged hospitalization

✓ The **geriatric team** should be closely associated to the management of this patient group to prevent autonomy loss

Conclusions: The nursing care plan elaborate for the TAVI patients seems adapted to the nursing care required after TAVI but has been and is still amenable for improvement.