

Kathetergestützte Aortenklappenimplantation – Herausforderungen für die Anästhesiepflege

Markus Maurer, Jens Fasel

Referenzen:

- 1 lung B, Baron G, Butchart EG, Delahaye F, Gohlke-Barwolf C, Levang OW, Tornos P, Vanoverschelde JL, Vermeer F, Boersma E, Ravnaud PV, Vahanian A. (2003) A prospective survey of patients with valvular heart disease in Europe: The Euro Heart Survey on Valvular Heart Disease. *Eur Heart J*; 24: 1231-1243.
- 2 Nkomo VT, Gardin JM, Skelton TN, Gottdiener JS, Scott CG, Enriquez-Sarano M. (2006) Burden of valvular heart diseases: a population-based study. *Lancet*; 368: 1005-1011.
- 3 Lindroos M, Kupari M, Heikkilä JT, Ilvius R. (1993) Prevalence of aortic valve abnormalities in the elderly: an echocardiographic study of a random population sample. *J Am Coll Cardiol*; 21: 1220-1225.
- 4 Bonow RO, Carabello BA, Kanu C, de Leon AC, Jr., Faxon DP, Freed MD, Gaasch WH, Lytle BW, Nishimura RA, O'Gara PT, O'Rourke RA, Otto CM, Shah PM, Shanewise JS, Smith SC, Jr., Jacobs AK, Adams CD, Anderson JL, Antman EM, Fuster V, Halperin JL, Hiratzka LF, Hunt SA, Nishimura R, Page RL, Riegel B. (2006) ACC/AHA 2006 guidelines for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (writing committee to revise the 1998 Guidelines for the Management of Patients With Valvular Heart Disease): developed in collaboration with the Society of Cardiovascular Anesthesiologists: endorsed by the Society for Cardiovascular Angiography and Interventions and the Society of Thoracic Surgeons. *Circulation*; 114: e84-231.
- 5 Vahanian A, Baumgartner H, Bax J, Butchart E, Dion R, Filippatos G, Flachskampf F, Hall R, Jung B, Kasprzak J, Nataf P, Tornos P, Torracca L, Wenink A. (2007) Guidelines on the management of valvular heart disease: The Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology. *Eur Heart J*; 28: 230-268.
- 6 Schwarz F, Baumann P, Manthey J, Hoffmann M, Schuler G, Mehmel HC, Schmitz WK, Kubler W. (1982) The effect of aortic valve replacement on survival. *Circulation*; 66: 1105-1110.
- 7 Murphy ES, Lawson RM, Starr AR, Ahimtoola SH. (1981) Severe aortic stenosis in patients 60 years of age or older: left ventricular function and 10-year survival after valve replacement. *Circulation*; 64: 1184-1188.
- 8 Vahanian A, Alfieri O, Al-Attar N, Antunes M, Bax J, Cormier B, Cribier A, De Jaegere P, Fournial G, Kappetein AP, Kovac J, Ludgate S, Maisano F, Moat N, Mohr F, Nataf P, Pierard L, Pomar JL, Schofer J, Tornos P, Tuzcu M, van Hout B, Von Segesser LK, Walther T. (2008) Transcatheter valve implantation for patients with aortic stenosis: a position statement from the European Association of Cardio-Thoracic Surgery (EACTS) and the European Society of Cardiology (ESC), in collaboration with the European Association of Percutaneous Cardiovascular Interventions (EAPCI). *Eur Heart J*; 29: 1463-1470.
- 9 Leon MB, Smith CR, Mack M, Miller DC, Moses JW, Svensson LG, Tuzcu EM, Webb JG, Fontana GP, Makkar RR, Brown DL, Block PC, Guyton RA, Pichard AD, Bavaria JE, Herrmann HC, Douglas PS,

Petersen JL, Akin JJ, Anderson WN, Wang DP, Cockcroft S. Transcatheter aortic-valve implantation for aortic stenosis in patients who cannot undergo surgery. *N Engl J Med*; 363: 1597-1607.

- 10 Smith CR, Leon MB, Mack MJ, Miller DC, Moses JW, Svensson LG, Tuzcu EM, Webb JG, Fontana GP, Makkar RR, Williams M, Dewey T, Kapadia S, Babaliaros V, Thourani VH, Corso P, Pichard AD, Bavaria JE, Herrmann HC, Akin JJ, Anderson WN, Wang DP, Cockcroft SJ. (2011) Transcatheter versus surgical aortic-valve replacement in high-risk patients. *N Engl J Med*; 364: 2187-2198.
- 11 Webb JG, Chandavimol M, Thompson CR, Ricci DR, Carere RG, Munt BI, Buller CE, Pasupati S, Lichtenstein S. (2006) Percutaneous aortic valve implantation retrograde from the femoral artery. *Circulation*; 113: 842-850.
- 12 Fraccaro C, Napodano M, Tarantini G, Gasparetto V, Gerosa G, Bianco R, Bonato R, Pittarello D, Isabella G, Iliceto SRamondo A. (2009) Expanding the eligibility for transcatheter aortic valve implantation the trans-subclavian retrograde approach using: the III generation CoreValve revalving system. *JACC Cardiovasc Interv*; 2: 828-833.
- 13 Guarracino F, Covello RD, Landoni G, Baldassarri R, Stefani M, Cariello C, Ruggeri L, Franco A, Gerli C, Pappalardo F, Zangrillo A. Anesthetic Management of Transcatheter Aortic Valve Implantation With Transaxillary Approach. *J Cardiothorac Vasc Anesth*.
- 14 Bojara W, Mumme A, Gerckens U, Lindstaedt M, Gotzmann M, Germing A, Fritz M, Pennekamp WMugge A. (2009) Implantation of the CoreValve self-expanding valve prosthesis via a subclavian artery approach: a case report. *Clin Res Cardiol*; 98: 201-204.
- 15 Sharp AS, Michev I, Colombo A. First trans-axillary implantation of Edwards Sapien valve to treat an incompetent aortic bioprosthesis. *Catheter Cardiovasc Interv*; 75: 507-510.
- 16 Lopez-Otero D, Munoz-Garcia AJ, Avanzas P, Lozano I, Alonso-Briales JH, Souto-Castro P, Moris C, Hernandez-Garcia JM, Trillo-Nouche R. Axillary approach for transcatheter aortic valve implantation: optimization of the endovascular treatment for the aortic valve stenosis. *Rev Esp Cardiol*; 64: 121-126.
- 17 Petronio AS, De Carlo M, Bedogni F, Marzocchi A, Klugmann S, Maisano F, Ramondo A, Ussia GP, Ettori F, Poli A, Brambilla N, Saia F, De Marco F, Colombo A. Safety and efficacy of the subclavian approach for transcatheter aortic valve implantation with the CoreValve revalving system. *Circ Cardiovasc Interv*; 3: 359-366.
- 18 De Robertis F, Asgar A, Davies S, Delahunty N, Kelleher A, Trimlett R, Mullen M, Moat N. (2009) The left axillary artery--a new approach for transcatheter aortic valve implantation. *Eur J Cardiothorac Surg*; 36: 807-812.
- 19 Elhmidi Y, Bleiziffer S, Piazza N, Hutter A, Opitz A, Hettich I, Kornek M, Ruge H, Brockmann G, Mazzitelli DLange R. Incidence and predictors of acute kidney injury in patients undergoing transcatheter aortic valve implantation. *Am Heart J*; 161: 735-739.
- 20 Bagur R, Webb JG, Nietlispach F, Dumont E, De Laroche R, Doyle D, Masson JB, Gutierrez MJ, Clavel MA, Bertrand OF, Pibarot P, Rodes-Cabau J. Acute kidney injury following transcatheter aortic valve implantation: predictive factors, prognostic value, and comparison with surgical aortic valve replacement. *Eur Heart J*; 31: 865-874.
- 21 Dawkins S, Hobson AR, Kalra PR, Tang AT, Monroe J, Dawkins KD. (2008) Permanent pacemaker implantation after isolated aortic valve replacement: incidence, indications, and predictors. *Ann Thorac Surg*; 85: 108-112.

- 22 Limongelli G, Ducceschi V, D'Andrea A, Renzulli A, Sarubbi B, De Feo M, Cerasuolo F, Calabro RCotrufo M. (2003) Risk factors for pacemaker implantation following aortic valve replacement: a single centre experience. *Heart*; 89: 901-904.
- 23 Gordon RS, Ivanov J, Cohen GRalph-Edwards AL. (1998) Permanent cardiac pacing after a cardiac operation: predicting the use of permanent pacemakers. *Ann Thorac Surg*; 66: 1698-1704.
- 24 Elahi MUmaan K. (2006) The bioprosthesis type and size influence the postoperative incidence of permanent pacemaker implantation in patients undergoing aortic valve surgery. *J Interv Card Electrophysiol*; 15: 113-118.
- 25 Khawaja MZ, Rajani R, Cook A, Khavandi A, Moynagh A, Chowdhary S, Spence MS, Brown S, Khan SQ, Walker N, Trivedi U, Hutchinson N, De Belder AJ, Moat N, Blackman DJ, Levy RD, Manoharan G, Roberts D, Khogali SS, Crean P, Brecker SJ, Baumbach A, Mullen M, Laborde JCHildick-Smith D. Permanent pacemaker insertion after CoreValve transcatheter aortic valve implantation: incidence and contributing factors (the UK CoreValve Collaborative). *Circulation*; 123: 951-960.
- 26 Jilaihawi H, Chin D, Vasa-Nicotera M, Jeilan M, Spyt T, Ng GA, Bence J, Logtens EKovac J. (2009) Predictors for permanent pacemaker requirement after transcatheter aortic valve implantation with the CoreValve bioprosthesis. *Am Heart J*; 157: 860-866.
- 27 Roten L, Wenaweser P, Delacretaz E, Hellige G, Stortecky S, Tanner H, Pilgrim T, Kadner A, Eberle B, Zwahlen M, Carrel T, Meier BWindecker S. Incidence and predictors of atrioventricular conduction impairment after transcatheter aortic valve implantation. *Am J Cardiol*; 106: 1473-1480.
- 28 Ussia GP, Scarabelli M, Mule M, Barbanti M, Cammalleri V, Imme S, Aruta P, Pistritto AM, Carbonaro A, Deste W, Sciuto P, Licciardello G, Calvi VTamburino C. Postprocedural management of patients after transcatheter aortic valve implantation procedure with self-expanding bioprosthesis. *Catheter Cardiovasc Interv*; 76: 757-766.
- 29 Fassel J, Walther T, Groesdonk HV, Kempfert J, Borger MA, Scholz M, Mukherjee C, Linke A, Schuler G, Mohr FW, Ender J. (2009) Anesthesia Management for Transapical Transcatheter Aortic Valve Implantation: A Case Series. *J Cardiothorac Vasc Anesth*.
- 30 Fassel J. (2012) Pro: Transcatheter Aortic Valve Implantation Should Be Performed With General Anesthesia, *J Cardiothorac Vasc Anesth*. Vol 25 No 4 August p733-735
- 31 Guarracino F, Landoni G. (2012) Con: Transcatheter Aortic Valve Implantation Should Not Be Performed Under General Anesthesia, *J Cardiothorac Vasc Anesth*. Vol 25 No 4 August p736-739
- 32 Dehedin B, Guinot PG, Ibrahim H, Allou N, Provenchere S, Dilly MP, Vahanian A, Himbert D, Brochet E, Radu C, Nataf P, Montravers P, Longrois DDepoix JP. (2011) Anesthesia and Perioperative Management of Patients Who Undergo Transfemoral Transcatheter Aortic Valve Implantation: An Observational Study of General Versus Local/Regional Anesthesia in 125 Consecutive Patients. *J Cardiothorac Vasc Anesth*.
- 33 Morris D, Mulvihill DLew WY. (1987) Risk of developing complete heart block during bedside pulmonary artery catheterization in patients with left bundle-branch block. *Arch Intern Med*; 147: 2005-2010.
- 34 Matthews IG, Fazal IA, Bates MGTurley AJ. In patients undergoing aortic valve replacement, what factors predict the requirement for permanent pacemaker implantation? *Interact Cardiovasc Thorac Surg*; 12: 475-479.

- 35 Webb JG, Pasupati S, Achtem L, Thompson CR. (2006) Rapid pacing to facilitate transcatheter prosthetic heart valve implantation. *Catheter Cardiovasc Interv*; 68: 199-204.
- 36 Guinot PG, Depoix JP, Etchegoyen L, Benbara A, Provenchere S, Dilly MP, Philip I, Enguerand D, Ibrahim H, Vahanian A, Himbert D, Al-Attar N, Nataf P, Desmonts JM, Montravers P, Longrois D. (2010) Anesthesia and perioperative management of patients undergoing transcatheter aortic valve implantation: analysis of 90 consecutive patients with focus on perioperative complications. *J Cardiothorac Vasc Anesth*; 24: 752-761.
- 37 Bergmann L, Kottenberg E, Heine T, Kahlert P, Eggebrecht H, Wendt D, Thielmann M, Jakob H, Erbel R, Peters J. (2009) [Anesthesia with transfemoral and transapical aortic valve implantation. Periinterventional management and hemodynamic observations]. *Herz*; 34: 381-387.
- 38 Fassel J, Walther T, Groesdonk HV, Kempfert J, Borger MA, Scholz M, Mukherjee C, Linke A, Schuler G, Mohr FW, Ender J. (2009) Anesthesia management for transapical transcatheter aortic valve implantation: a case series. *J Cardiothorac Vasc Anesth*; 23: 286-291.
- 39 Kempfert J, Walther T, Borger MA, Lehmann S, Blumenstein J, Fassel J, Schuler G, Mohr FW. (2008) Minimally invasive off-pump aortic valve implantation: the surgical safety net. *Ann Thorac Surg*; 86: 1665-1668.
- 40 Shannon J, Mussardo M, Latib A, Takagi K, Chieffo A, Montorfano M, Colombo A. (2011) Recognition and management of complications during transcatheter aortic valve implantation. *Expert review of cardiovascular therapy*; 9: 913-926.
- 41 (Riediger C, Nietlispach F, Rüter F, Fassel J (2011) Kathetergestützte Aortenklappen- Implantation - was müssen Anästhesisten wissen? *Der Anaesthetist* 60:1095–1108)