

Is Tricuspid Lesion a Predictor of mortality Risk in Surgical Mitral Valve Replacement ?

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Abstract

Tricuspid insufficiency is frequently found in patients with left heart valve disease, especially mitral valve disease. Our study included 214 patients with mitral stenosis associated or not with a lesion of the tricuspid valve.

The aim of our work is to show that grade II-III tricuspid insufficiency is a risk factor for mitral valve replacement mortality in mitral stenosis.

A total of 214 patients underwent surgery in our department, 115 with isolated mitral stenosis (MR), and 99 with associated grade II-III tricuspid insufficiency. Any associated aortic or other lesions were excluded from the study. The study of operative mortality focused solely on MR pure or associated with tricuspid insufficiency. A statistical study was carried out using the kh2 test ($p=0.05$), and revealed that grade II to III tricuspid insufficiency was a statistically significant risk factor for operative mortality. We compare our results with those found in the literature.

Keywords: tricuspid insufficiency; echocardiography; mitral valve replacement; tricuspid plasty; mitral narrowing; operative mortality

Introduction :

Rheumatic heart disease (RHD), in this case left heart disease and especially mitral stenosis, is highly prevalent in developing countries [1]. They represent the most frequent cause of acquired heart disease in subjects under 25 years of age [2].

Tricuspid regurgitation is frequently observed in patients with left heart valve disease, particularly mitral valve disease [3, 4]. This leakage is most often functional, as a result of dilatation of the right cavities and tricuspid apparatus by hyperpressure, or organic, in relation to mitral valve damage.

Tricuspid annulus secondary to mechanical overload of the right ventricle, most often due to pulmonary hypertension, whatever the origin. Mitral or mitro-aortic lesions are frequently implicated [5], but more rarely hypertensive or ischemic left ventricular failure, cardiomyopathy, acute or chronic pulmonary heart disease, embolic or respiratory failure, and primary pulmonary hypertension [6,7].

Recent advances in valve replacement surgery have reduced the rate of early and late complications, and increased the survival rate of patients undergoing surgery, putting the emphasis on late IT. The unfavourable evolution of these leaks can compromise postoperative results and lead to increased morbidity and mortality [8]. In addition, tricuspid valve revision surgery is associated with a non-negligible mortality rate [6].

The aim of this study is to evaluate the postoperative results of surgery for tricuspid insufficiency related to left-heart valve damage, in particular mitral

stenosis, and to determine whether grade II to III tricuspid insufficiency is a risk factor for mortality in mitral valve replacement.

Materials and methods:

Our study included 214 patients ; only pure mitral narrowing and associated tricuspid lesions with grade II-III regurgitation were included. Aortic involvement was excluded from our study. In fact, 115 patients had isolated mitral narrowing and 99 had grade II-III tricuspid insufficiency. associated. The majority of patients were female (179 or 83.6%) and 35 or 16.3% male. The mean age was 39, with extremes of 16 for the youngest and 65 for the oldest.

Most patients were NYHA stage II sinus rhythm was found in the majority of patients. The mean cardiothoracic index was 0.69. The mean PAPS was 50mmhg. Myocardial function was preserved and the VD was 26mm with extremes of 16 and 45mm.

The mitral valve was calcified in the majority of patients on preoperative echocardiography. All patients underwent mechanical mitral replacement.

90 patients with tricuspid insufficiency II -III underwent Devega plasty. 3 patients underwent tricuspid annuloplasty, 2 patients required valve replacement due to extensive lesions. In four patients, associated tricuspid narrowing was found, necessitating commissurotomy.

Results:

Unfortunately, we had 15 deaths (7.09%), 5 patients dying intraoperatively from myocardial incompetence and 10 postoperatively from haemorrhage, respiratory infection, renal failure and endocarditis. We also studied the operative mortality of patients without associated tricuspid lesions, which was 4.34%. When mitral stenosis was associated with tricuspid insufficiency. Grade II to III, operative mortality was 10%.

Discussion :

Tricuspid damage, associated with mitral valve lesions, can lead to significant short- and long-term morbidity and mortality. Its surgical cure involves several techniques, the choice of which remains uncertain to this day. The aim of our work was to evaluate the operative mortality of mitral valve replacement linked to moderate to severe tricuspid involvement in rheumatic mitral stenosis, and to show that associated IT is an undeniable risk factor for mortality.

The mean age was 39, with extremes of 16 and 65. In fact, these results are found in the literature, notably in a Chinese study [2,3] and also in Tunisian series [9,10]. The patients in our study were younger than those in European and American studies [11,12], which can be explained by the predominance, in our study, of rheumatic aetiology compared with degenerative valve disease, which occurs at an older age. The predominance of women in our series, 83.6%, is clear, and is reported in the majority of published studies [10,12,13].

Grade II to III tricuspid leakage was found in 46.26% (99) of our patients; in the study by Bernal et al [12] and Tager et al [14], this stage of leakage was present in 98% and 25% of patients respectively. In line with the literature, there was a clear predominance of functional etiology [11,15,16]. The calculation of PAPs in our Series found a significant average of 50mmHg, and this value was similar in the other series [17,18]. The mean left ventricular ejection fraction (EF) of our patients was 64%. This value is very close to those found in other studies [10, 17,18]. DeVega tricuspid annuloplasty is the most frequently performed conservative procedure. This has also been reported in the literature [9, 10, 17,14 ; 19]. In other series Carpentier annuloplasty predominates [20]. In our work, the operative mortality is 7.07%, which is also found in the literature. In-hospital mortality varies considerably from one series to another, ranging from 0.6% to 37.1% [16]. A review of the literature shows that this rate is largely influenced, on the one hand, by cardiovascular status and associated lesions and, on the other hand, by the nature of the tricuspid procedure performed. In fact, mortality increases when tricuspid insufficiency is grade II to III. This was confirmed in our series, where the mortality rate rose from 4.34% when the mitral narrowing was isolated, to 10% when the tricuspid insufficiency was grade II or III. A statistical analysis using the Chi 2 method showed that moderate to severe tricuspid insufficiency is a factor that statistically predicts mortality risk ($p < 0.05\%$).

All authors emphasize the difficulty of assessing the operative mortality of the tricuspid procedure, since the surgery is double : mitral and tricuspid [16].

Conclusion:

The results of tricuspid surgery are highly variable, both in terms of surgical success and postoperative mortality. This is essentially due to the wide disparity between the different series, in terms of patient selection, the stage of heart disease at the time of surgery, the type of tricuspid surgery chosen and any associated left-valve procedures. IT Grade II to III is a factor that statistically has a predictive value for mortality. Surgery must be performed early, before the predictive risk factors that contribute to the morbidity and mortality of this pathology become established.

Reference

1. Watkins DA, Johnson CO, Colquhoun SM, Karthikeyan G, Beaton A, Bukhman G, et al. Global, Regional, and National Burden of Rheumatic Heart Disease, 1990–2015. *N Engl J Med*. 2017;377(8):713–722.
2. Hamidou Oumar Bâ1, Ibrahima Sangaré1, Youssouf Camara, all: Valvulopathies Rhumatismales de l'Adulte au CHU Gabriel Touré: à Propos de 314 Cas: *Health Sci. Disease/journal of medicine and biomedical science Vol 23 (4) April 2022pp 34-37*
3. Tager R, Skudicky D, Mueller U, Essop R, Hammond G, Sareli P. Long-term follow-up of rheumatic patients undergoing left-sided valve replacement with tricuspid annuloplasty. Validity of preoperative echocardiographic criteria in the decision to perform tricuspid annuloplasty. *Am J Cardiol* 1998; 81:1013-1016.
4. Kim HK, Kim YJ, Kim KI, et al. Impact of the maze operation combined with left-sided valve surgery on the change in tricuspid regurgitation over time. *Circulation* 2005 ; 112 (9suppl) :I14-119.
5. Salma Charfeddine, Rania Hammami, FatenTriki, Leila Abid, Mourad Hentati, Imed Frikha et al. La plastie tricuspide : annuloplastie de Carpentier versus technique de De VEGA. *Pan African Medical Journal*. 2017;27: 119. Google Scholar
6. Dreyfus GD, Corbi PJ, John Chan KM, Bahrami T. Secondary tricuspid regurgitation or dilatation: which should be the criteria for surgical repair? *Ann Thorac Surg*. 2005; 79(1): 127-123. Google Scholar
7. Salazar E, Levine HD. Rheumatic tricuspid regurgitation: the clinical spectrum. *Am J Med*. 1962; 33: 111-29. PubMed| Google Scholar
8. Xiao XJ, Huang HL, Zhang JF, et al. Surgical treatment of late tricuspid regurgitation after left cardiac valve replacement. *Heart Lung Circ*. 2004 ;13(1):65-69.
9. Djebbi M. La chirurgie dans les lésions acquises de la valve tricuspide. Thèse Monastir. 1997.
10. Youssef Ben Ameer, Ihsen Zairi, Kamel Kamoun, Mahdi Ben sassi, Salma Longo, Kais Battikh. *ML Slimane Atteinte Tricuspide au Cours de la Maladie Rhumatismale*. 2010.
11. Bernal JM, Gutierrez-Morlatte J, Liorca J. Tricuspid valve repair: An old disease, a modern experience. *Ann Thorac Surg*. 2004;78:2069–75.
12. Bernal JM, Ponton A, Diaz B, Llorca J, García I, Sarralde A, et al. Surgery for rheumatic tricuspid valve disease: a 30-years experience. *J Thorac Cardiovasc*. 2008;136:476–481.
13. Alsoufi B, Rao V, Borger M, Maganti M, Armstrong S, Feindel CM, et al. Short- and long-term results of triple valve surgery in the modern era. *Ann Thorac Surg*. 2006;81(6):2172–2718.
14. Tager R, Skudicky D, Mueller U, Essop R, Hammond G, Sareli P. Long-term follow-up of rheumatic patients undergoing left-sided valve replacement with tricuspid annuloplasty—validity of preoperative echocardiographic criteria in the decision to perform tricuspid annuloplasty. *Am J Cardiol*. 1998; 81:1013–1016.
15. Kuwaki k, Morishita K, Tsukamoto M, Abe T. Tricuspid valve surgery for functional tricuspid valve regurgitation associated with left-sided valvular disease. *Eur J Cardiothorac Surg*. 2001;20 (3):577–582.
16. Walid Ghodbane, Moncef Bey, Mokhles Lejmi, Karima Taamallah, Mohamed Tagorti, Anis Lebba. Slim Chenik: La chirurgie de l'insuffisance tricuspide: quelles leçons tirer de notre expérience? *Chirurgie Thoracique et Cardio-vasculaire*. 2012 ;16(4):200–206.

17. Guenther T, Noebauer C, Mazzitelli D, Busch R, Tassani-Prell P, Lange R. Tricuspid valve surgery: a thirty-year assessment of early and late outcome. *Eur J Cardiothorac Surg.* 2008;34: 402–409.
18. Cabrol C. Annuloplastie valvulaire : Un nouveau procédé *Nouv Presse Med.* 1972;1:1366.
19. Rivera R, Duran E, Ajuria M. Carpentier's flexible ring versus De Vega's annuloplasty: a prospective randomized study. *J Thorac Cardiovasc Surg.* 1985;89:196–203
20. Slimane ML, Bouakez A, Bouziri S, Zalila S, Ben Naceur M. Résultat de la correction des insuffisances tricuspides par valvuloplastie de Carpentier et annuloplastie de De Vega. *Tunis Med.* 1989;67:409–414.



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