

## End-stage heart failure: What choices are available for the Nigerian cardiologist?

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### ABSTRACT

**Background:** End-stage heart failure is often characterized by refractory symptoms, usually dyspnoea and fatigue at most times, despite optimal medical therapy. Specialized interventions are often required.

**Objective:** To highlight the availability of some specialized interventions for Nigerian patients with end-stage heart failure.

**Materials and Methods:** A 60-year-old man with chronic heart failure secondary to idiopathic dilated cardiomyopathy who was in steady state until 6 months prior to presentation when he developed recurrent episodes of exacerbation of symptoms despite optimal medical therapy. Echocardiography showed grossly dilated cardiac chambers, hypokinetic left ventricle, and ejection fraction (EF) of 20%. He was managed as a case of end-stage heart failure. Owing to poor response to medical therapy, specialized interventions were recommended.

**Result:** He subsequently had successful orthotopic cardiac transplantation and was commenced on triple immunosuppressant drug therapy.

**Conclusion:** All patients with end-stage heart failure should be availed the opportunity of having specialized interventions where resources are available.

**KEY WORDS:** Cardiac transplantation, end-stage heart failure, Nigeria

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## INTRODUCTION

End-stage heart failure refers to advanced heart failure in which patients suffer refractory symptoms despite maximal medical therapy. Patients with end-stage heart failure fall under stage D or advanced stage C heart failure according to the American College of Cardiology/American Heart Association guidelines.<sup>[1]</sup> This corresponds to class III-IV of the New York Heart Association functional classification.<sup>[2]</sup>

Studies on the prevalence of end-stage heart failure in Nigeria and sub-Saharan Africa are virtually nonexistent. No case of cardiac transplantation in a Nigerian has been reported.

## CASE REPORT

A 60-year-old male who had been on treatment for congestive cardiac failure for several years presented to the cardiology unit of the University of Calabar Teaching Hospital with worsening of symptoms of 2 week's

duration. He was neither hypertensive nor diabetic and did not drink alcohol. He was a non-smoker who had been adherent to his tablets: Digoxin, spironolactone, carvedilol, and frusemide.

Examination revealed an acute-on-chronically ill looking man in respiratory distress, acyanosed, afebrile (36.7°C), with bilateral pitting pedal edema up to the knees. The pulse was 90 beats/min, small volume, and irregular. His blood pressure was 110/70 mmHg and jugular venous pressure was elevated at 5 cm of water. The apex beat was diffuse and localized to the sixth left intercostal space, anterior axillary line. Heart sounds S1, S2, and S3 were heard with a pansystolic murmur radiating to the axilla. Respiratory rate was 32 cycles/min with bilateral basal coarse crepitations. There was tender hepatomegaly with no ascites.

Investigations revealed a packed cell volume of 45%. Electrocardiogram showed a heart rate of 74 beats/min and sinus rhythm with ventricular ectopics and left ventricular hypertrophy. QTc was 502 ms. Chest

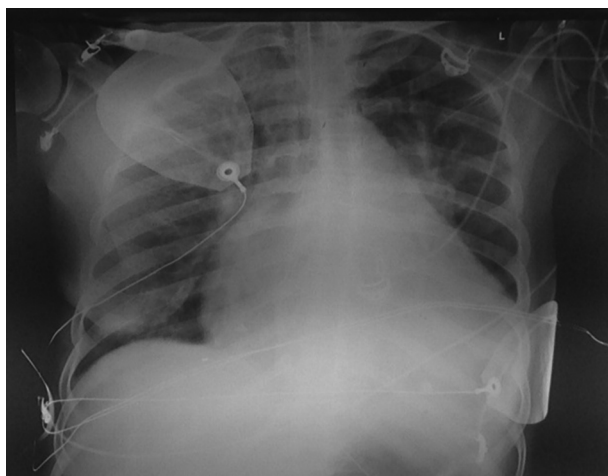
radiograph revealed a global cardiomegaly [Figure 1]. Echocardiogram showed global chamber dilatation and severe left ventricular systolic dysfunction with an ejection fraction (EF) of 20%.

His response to intensive medical therapy was unsatisfactory. Serial transthoracic echocardiography showed left ventricular EF (LVEF) persistently below 20%. He was counseled on the options for his further management which included cardiac transplantation. He opted for cardiac transplantation and was referred accordingly.

Orthotopic heart transplantation was carried out and immunosuppressive medications commenced using tacrolimus, mycophenolate mofetil, and prednisolone. He also received prophylactic cotrimoxazole and valganciclovir as well as atorvastatin. Postoperative echocardiography showed an EF of 68%, moderate left ventricular hypertrophy, mild tricuspid regurgitation, and normal right and left ventricular function with a marked improvement in his functional status.

End-stage heart disease is an increasingly important cause of morbidity and mortality in developing climes. Managing patients with end-stage heart failure poses great difficulty as many of the desirable interventions are unavailable.

Options available to the cardiologist in developing settings are few and include optimizing medical therapy as well as prompt referral of patients for advanced therapies like cardiac resynchronization and cardiac transplantation. Use of inotropes are recommended for patients with severe symptoms who are unable to obtain mechanical circulatory support or cardiac transplantation.<sup>[3]</sup> Only intermittent use is recommended as prolonged use has been shown to worsen mortality.<sup>[2]</sup> This option was not explored for



**Figure 1:** Chest radiograph showing cardiomegaly with upper lobe diversion of the pulmonary vessels

the index patient due to unavailability of drugs such as dobutamine and dopamine.

Invasive measures as implantable cardioverter defibrillators (ICDs) are useful for primary prophylaxis against sudden cardiac death in advanced heart failure with LVEF < 35%. Cardiac resynchronization therapy (CRT) is useful in patients with LVEF  $\leq$  35%, sinus rhythm, and left bundle branch block with a QRS duration  $\geq$  150 ms.<sup>[4]</sup> The expertise for these measures is gradually being established in our health system though they remain quite expensive.

Cardiac transplantation is the mainstay of management of end-stage heart failure unless contraindicated. The index patient had dilated cardiomyopathy with very low LVEF, which is the commonest indication for cardiac transplantation.<sup>[5]</sup> Contraindications include active systemic diseases like collagen vascular disease, malignancy, active systemic infections, drug abuse, and psychosocial instability. Worldwide, cardiac transplant offers the best treatment option for end-stage heart disease. The cost, surgical expertise, and scarcity of donor hearts mean that only the relatively affluent can afford this option. However, there is need for greater awareness among physicians of this alternative for patients despite the high financial involvement.

Two types of transplantation are available—orthotopic and heterotopic cardiac transplantation. In the past decade, orthotopic transplant (recipient's heart is replaced with the donor heart) has shown a 1-year survival rate of 91%, while heterotopic transplant (donor heart is placed alongside the recipient's heart) is 71%.<sup>[6]</sup> The donor age is preferably < 55 years, and the index patient received from a 53-year-old donor. At ages 45–55 years, it is important that ischemic time is adhered to for optimal outcome.<sup>[7]</sup>

The major challenge in our setting was monitoring of the immunosuppression medications postoperatively. Tacrolimus, mycophenolate mofetil, and prednisolone were used in our patient to maintain immunosuppression as recommended from results of several trials.<sup>[8]</sup> Monitoring drug levels and maintaining therapeutic levels is associated with better allograft and patient outcomes.<sup>[9]</sup> This was not possible in our setting and constituted a drawback in the postoperative care of our patient. Inadequate levels of immunosuppression could lead to an increase in the incidence of cardiac allograft vasculopathy and allograft rejection, both of which contribute to negative outcomes.

The 1-year survival following heart transplant is about 81.8% and 5-year survival 69.8%. Hypertension, diabetes mellitus, and obesity are associated with exponential increases in postoperative mortality rates.<sup>[5]</sup> A retrospective study of 20,185 adult patients

who received orthotopic heart transplant showed that African American recipients had an 11.4% absolute decrease in 10-year survival compared with Caucasian and African American recipients had a 46% increase in the risk of cumulative mortality (hazard ratio, 1.46; 95% confidence interval, 1.24–1.72; and  $P < 0.001$ ).<sup>[10]</sup> It was not clear why mortality rates are higher in blacks. Unfortunately, no published data on cardiac transplant patients and outcome in Nigeria could be sourced.

Despite the challenges, patients with end-stage heart failure can have marked improvement in their quality of life after cardiac transplantation and should be offered this.

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## REFERENCES

1. Hunt SA, Abraham WT, Chin MH, Feldman AM, Francis GS, Ganiats TG, *et al.* 2009 focused update incorporated into the ACC/AHA 2005 Guidelines for the Diagnosis and Management of Heart Failure in Adults: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines: Developed in collaboration with the International Society for Heart and Lung Transplantation. *Circulation* 2009;53:e1-90.
2. Friedrich EB, Böhm M. Management of end stage heart failure. *Heart* 2007;93:626-31.
3. Toma M, Starling RC. Inotropic therapy for end-stage heart failure patients. *Curr Treat Options Cardiovasc Med* 2010;12:409-19.
4. Tracy CM, Epstein AE, Darbar D, DiMarco JP, Dunbar SB, Estes NA, *et al.* 2012 ACCF/AHA/HRS focused update of the 2008 guidelines for device-based therapy of cardiac rhythm abnormalities: A report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm. *Circulation* 2012;126:1784-800.
5. Botta DM, Mancini MC. Heart Transplantation. Available from: <http://emedicine.medscape.com/article/429816-overview> [Last accessed on 2014 Nov 3].
6. Norton J, Barie PS, Bollinger RR, Chang AE, Lowry S. Basic Science and Clinical Evidence. In: Victor O. Ansa VO, Otu AA, 1, Onwurah C, Chukwudike E. End-stage heart failure: What choices are available for the Nigerian cardiologist?. editors. 2<sup>nd</sup> ed. Springer; 2008.
7. Costanzo MR, Anderson A, Chan M, Desai S, Fedson S, Fisher P, *et al.* Guidelines for the care of heart transplant recipients. *J Heart Lung Transplant* 2010;29:915-56.
8. Aliabadi A, Cochrane AB, Zuckermann AO. Current strategies and future trends in immunosuppression after heart transplantation. *Curr Opin Organ Transplant* 2012;17:540-5.
9. Eisen HJ, Hobbs RE, Davis SF, Carrier M, Mancini DM, Smith A, *et al.* Safety, tolerability, and efficacy of cyclosporine microemulsion in heart transplant recipients: a randomized, multicenter, double-blind comparison with the oil-based formulation of cyclosporine – results at 24 months after transplantation. *Transplantation* 2001;71:70-8.
10. Allen JG, Weiss ES, Arnaoutakis GJ, Russell SD, Baumgartner WA, Conte JV, *et al.* The impact of race on survival after heart transplantation – an analysis of over 20,000 patients. *Ann Thorac Surg* 2010;89:1956-63.

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