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Bronchoscopic balloon dilatation in the management of bronchial stenosis following lung transplantation

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Summary
Background: Bronchial stenosis (BS) is currently found in 7–15% of lung transplantation (LT) recipients. Current treatment strategies have included Nd:Yag laser, cryotherapy, bougie dilatation and stent placement. Bronchoscopic balloon dilatation has been used as alternative treatment in a few cases with controversial results. This is a study to prospectively assess the efficacy of bronchoscopic balloon dilatation as a first step in the management of post-LT BS.
Methods: From January 1995 to December 2002, bronchoscopic balloon dilatation was evaluated as first therapeutic option in all consecutive LT patients with BS. Symptoms, pulmonary function tests, airway diameter and use of other therapeutic techniques were evaluated.
Results: A total of 10 out of 284 anastomed airways (3.5%) in 9 out of 152 LT patients were included in the study and follow-up lasted from 6 to 81 months. Dilatation of all but one BS met with initial success: increase of both luminal dimensions and forced vital capacity ($P = 0.01$), and relief of symptoms. Bronchoscopic balloon dilatation long-term follow-up showed effective results in 5 out of 10 (50%) bronchial stenoses, after an average of 4 bronchoscopic balloon dilatation procedures (range 1–8). No severe complications were observed. Stent placement was required in the other 5 bronchial stenoses.

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Conclusions: Bronchoscopic balloon dilatation is a safe method that should be considered as first therapeutic treatment of post-LT BS. Its use avoids the need for stent placement in up to 50% of cases.

Introduction

Bronchial stenosis (BS) has been associated with illnesses of several etiologies.[1] Lung transplantation (LT), with an incidence of BS ranging from 7% to 15% of cases, is currently one of the most frequent causes.[2] Management of BS of any etiology, based on the application of cryotherapy, laser therapy, bougie dilatation during rigid bronchoscopy and stent placement, has displayed its efficacy depending on the site and features of the BS. Nevertheless, morbidity inherent or secondary to the procedure is frequent with these techniques,[2–8] especially secondary to stent placement, the most commonly used treatment, where complications have been observed in up to 75% of cases.[7,8] Bronchoscopic balloon dilatation (BBD) has recently been used as alternative treatment in retrospective studies,[1–3,5,9,10] four of which were performed only in LT recipients,[2,3,5,10] with low morbidity and limited efficacy. However, there are no studies evaluating efficacy of BBD as the first step in the management of these patients.

The aim of this study was to prospectively assess the efficacy of BBD using fiberoptic bronchoscopy (FOB) as definitive or contributing treatment of BS after LT.

Patients and methods

From January 1995 to December 2002 all LT recipients transferred from the intensive care unit and diagnosed with BS by FOB were initially included in the study. BBD was indicated as the first therapeutic procedure in all patients with BS of over 50% of bronchus diameter confirmed by means of FOB. Patients with formal FOB contraindication or those not wishing to take part were ruled out from the study.

Lung transplantation (LT)

LT, without revascularization procedures, were performed as described previously.[11] All patients were on the same immunosuppression protocol based on triple therapy with cyclosporine, azathioprine and corticosteroids. Acute rejection was treated with pulse intravenous methylprednisolone for 3 days. Tacrolimus was included at the initial immunosuppression in some cases or as rescue therapy in patients with persistent or recurrent rejection. Occasionally, mycophenolate mofetil or methotrexate replaced azathioprine for the same indication.

All cytomegalovirus-seropositive recipients received ganciclovir prophylaxis for the first 45 days or in the case of seronegative recipients with a seropositive donor for 90 days. Similarly, all patients were treated with nebulized amphotericin B and oral cotrimoxazol prophylaxis three times a week for life.

BS diagnosis

All patients had BS of over 50% of bronchus diameter confirmed by means of FOB (Fig. 1). Al least one fiberoptic bronchoscopy was performed on all patients prior to discharge. Additional FOBs were indicated when respiratory symptoms were present and/or pulmonary function tests were suggestive of intrathoracic stenosis. Computed

Figure 1 Stenosis on intermedius bronchus.