

Development of allergic asthma in an asthmatic recipient of a nonatopic lung under systemic immunosuppression

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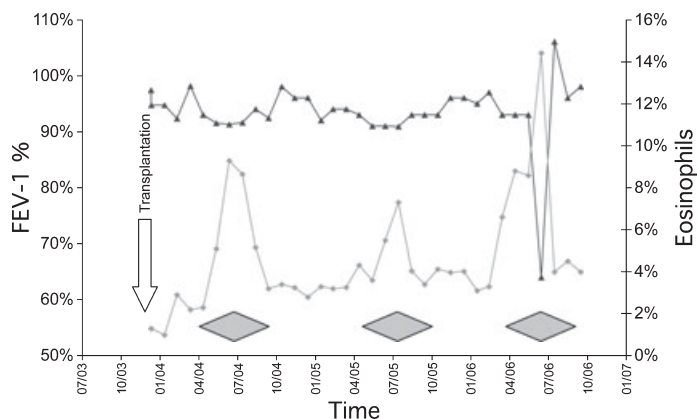
In 1993 Corris and Dark

reported on two nonasthmatic recipients of asthmatic lungs who developed asthma after transplantation and two asthmatic recipients of normal lungs who did not develop asthma after transplantation. From these observations they concluded that asthma is a 'local' disease (1). In this report, we present a patient whose asthma resolved initially after lung transplantation from a nonasthmatic donor and who suffered from an asthma attack in the third year after transplantation.

A 13-year-old boy with a history of asthma and allergic rhinoconjunctivitis with confirmed sensitizations towards birch- and grass pollen (Serum IgE value before transplantation 50.2 and 75.3 kU/l respectively) underwent heart–lung transplantation due to a restrictive cardiomyopathy and secondary severe pulmonary hypertension. The donor had no medical history of atopy. After transplantation, the patient received an immunosuppressive therapy with tacrolimus (blood level 7–10 ng/ml), mycophenolate mofetil (500 mg/day) and prednisolone (5 mg/day). The asthmatic symptoms disappeared completely after transplantation and lung function was stabilized with forced expiratory volume in 1 second of around 95% predicted (Fig 1). In contrast, allergic rhinoconjunctivitis symptoms persisted with the patient complaining particularly during the months of May–August in the following 3 years while simultaneously an increase of blood eosinophils was

Asthma is not a local disease that can be removed with a transplanted organ.

Figure 1. Course of forced expiratory volume in 1 s (FEV₁), blood eosinophils and symptoms of allergic rhinoconjunctivitis after transplantation. — FEV₁; — Eosinophils; ◇ Allergic rhinoconjunctivitis symptoms.



detectable (Fig 1). Three years after the transplantation, the patient was admitted to hospital in the middle of June with typical signs of an asthma attack in addition to symptoms of allergic rhinoconjunctivitis. At this time total IgE was 1560 kU/l, birch-pollen specific IgE > 100 kU/l and grass-pollen specific IgE 80.2 kU/l. Under treatment with salbutamol and steroids (3-day course of prednisolone 2 mg/kg/day) the patient's condition improved rapidly. Five days after admission the asthmatic symptoms had disappeared completely and the initially strongly impaired lung function returned to normal (Fig. 1). There was no clinical, radiologic, bronchoscopic or laboratory evidence for infection or transplant rejection. Bronchial hyperresponsiveness was proved by metacholine challenge 6 weeks after discharge from hospital.

The history of this patient supports the claim that allergic asthma is not only a local disease that can be cured with the 'removal' of an organ. As the recipient of a normal lung, the patient who was suffering from asthma before transplantation became asthmatic again after transplantation. He had signs of systemic allergic inflammation with seasonal increase of blood eosinophils and also distinct allergic symptoms of the upper respiratory tract. It seems likely that allergic inflammatory cells infiltrated the nonatopic graft and induced asthma, supporting the theory of 'one airway disease' (2). Why asthmatic symptoms did not appear earlier is not clear, it might be due to the intense pollen count

of that particular third year after transplantation. Next to the phenomenon that allergic asthma was not removed with the organ, another interesting phenomenon was that allergic symptoms persisted under strong immunosuppressive therapy. There is some evidence that tacrolimus, prednisolone and mycophenolate mofetil play a role in the prevention and treatment of allergic diseases (3–5). However, in our case, this medication did not inhibit the course of the allergic rhinoconjunctivitis in the patient and did not prevent the development of asthma in the transplanted lung. Accordingly, it has recently been demonstrated that therapeutic immunosuppression with tacrolimus, mycophenolate mofetil and steroids does not control allergies in organ-transplanted children and adolescents (6). This is to our knowledge the first case report of the recurrence of asthma in an atopic recipient of normal lungs. The history of the patient presented here demonstrates that allergic diseases are mainly systemic diseases that cannot be removed with a transplanted organ and can persist and reappear even under strong immunosuppressive therapy.

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