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CASE REPORT

Transplantation of a latissimus dorsi flap between identical twins

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Summary We present a case of composite tissue transplantation of a latissimus dorsi flap between monozygotic twins. The recipient twin, a 19 year old male, suffered from a complex spinal kyphoscoliosis for which he had undergone multiple previous operations over many years. Soft tissue breakdown on his back causing metalwork exposure had necessitated the removal of his most recent spinal rod. This in turn led to rapid severe deterioration of his spinal deformity and consequent critical impairment of lung function. Robust soft tissue cover was required urgently in order to allow the insertion of a new spinal rod. His previous surgeries and body habitus precluded an adequate autologous reconstruction. Instead, reconstruction using composite tissue transplantation from his identical twin brother was successfully undertaken. We discuss the ethical, psychological and surgical issues involved in this case.

Case report

Transplantation of tissue between genetically identical individuals can be an excellent reconstructive option to the plastic surgeon, albeit in highly selected circumstances. Tissue rejection is not encountered following this type of transplantation (isotransplantation) and so recipients do not require immunosupression. Therefore, they avoid the adverse long-term side effects of such therapy, familiar to reconstructive surgeons working in the field of composite tissue allotransplantation.[1]

A 19-year-old male patient was referred for consideration of soft tissue coverage of a large defect on his back. He had suffered since infancy from complex spinal kyphoscoliosis and progressive vertebral collapse; his height was only 1.55 m (Figure 1). He also had a congenital amelic deformity of his right upper limb. By contrast, his monozygotic twin brother was healthy, having a much larger skeleton (height 1.81 m), with normal spinal and upper limb anatomy.

The affected twin had undergone repeated spinal fixation during childhood and adolescence to correct his scoliosis. Over time the overlying skin became scarred and unstable

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Figure 1 Preoperative view of the affected twin's back (left lateral and posterior views), showing a complex spinal kyphoscoliosis associated with extensively scarred, unstable skin and soft tissue over a large proportion of the thoracolumbar region. There is an ulcerated region (dressed) centre-right. The right upper limb is affected by a congenital amelic deformity.

(Figure 2). Eventually, wound breakdown and intractable infection meant that the spinal rods had to be removed. This led to a rapid deterioration of his scoliosis deformity and critical impairment of lung function, with recurrent chest infections ultimately requiring ventilatory support. A definitive one-stage soft tissue reconstruction was urgently required in order to allow revision spinal fixation to be undertaken. Chest physician and anaesthetic colleagues counselled that without such surgery, his lung function would deteriorate further and threaten his life.

The back defect overlay his thoracic spinal processes, directly over the point of maximal spinal deformity and pressure; in such a small and cachectic individual it represented a large proportion of his back (Figures 1—3). Autologous reconstructive options for complex back wounds are well reported and include local flaps, regional flaps and free tissue transfer techniques.[2—5] The principal flaps recommended were all unsuitable. In particular, neither free latissimus dorsi nor anterolateral thigh flaps would provide a sufficiently large skin paddle, and a free deep inferior epigastric flap would risk further compromising ventilation. Also, his poor nutritional status put him at an increased risk of wound healing problems irrespective of donor site.

A tissue isotransplantation procedure, with the unaffected twin brother as donor, offered potentially the best reconstructive solution to this challenging problem. By contrast, this brother was fit and well with a much larger skeleton and normal anatomy. Isotransplantation of a myocutaneous latissimus dorsi flap would achieve complete and robust resurfacing of the defect.

The preliminary step in assessment was confirmation that the brothers were indeed monozygotic twins, and this was obtained using a DNA microsatellite homozygosity

Figure 2 View of the wound on the affected twin's back immediately prior to surgical debridement of the unstable skin and soft tissue (left lateral position). The blue ink lines denote the margins of debridement planned.

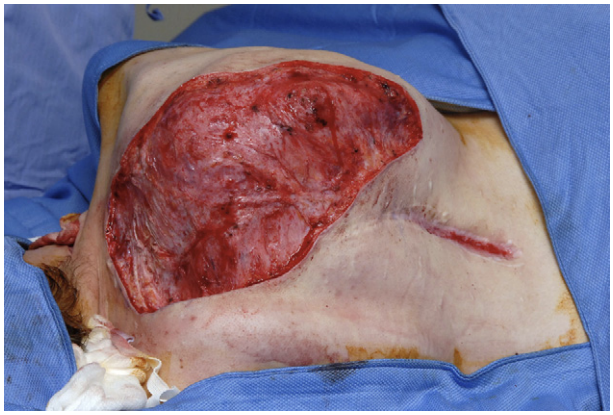

Figure 3 Intraoperative view of the affected twin's back following surgical debridement of the unstable skin and soft tissue (left lateral position).