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# Ten years later – scalp still a primary donor site in children

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## ABSTRACT

Choice of the donor site for a split thickness skin graft depends on skin availability, possible complications and anticipated esthetic results. We selected the scalp to be the primary donor site at our institution. During a period of ten years (1998–2008), a group of 123 pediatric patients aged 4 months to 15 years (65% were below the age of 2; mean age 2.98 years) underwent skin grafting from this particular site. In 2 cases the same area was re-harvested. All donor sites healed by the 10th post-operative day. Donor site complications included: 2 microalopecia regions, 5 pressure sores in a close proximity, 1 hypertrophic scar and 1 visible mark on the forehead due to technical mistake in graft harvesting. All children started scar management of the recipient site with contact therapy using adhesive tape Hypafix (BSN Medical); subsequently moving on to silicone sheets or gel in selected refractory cases. We present results for 68 scars in 41 patients with the longest follow-up period. Scar quality was evaluated after minimum of 10 years and scored according to the Vancouver Scar Assessment Scale. Very good and good results were obtained in 55 scars (80.9%), satisfactory in 11 scars (16.2%) and unsatisfactory in 2 scars (2.9%).  
Conclusions: Our results confirm, that the scalp is a reliable donor site in children and contact therapy is an adequate form of scar prevention/treatment of the recipient site.

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## 1. Introduction

Treatment of deep burns, in a similar manner as other skin defects, requires surgical debridement of all necrotic tissue and coverage of the wound with an autograft. Split thickness skin grafts may be harvested from nearly any part of the human body with a traditional exception of the face and hands. However, it is difficult to choose a perfect donor site, which provides sufficient amount of skin, good skin texture and color match, as well as is associated with a low complication rate. Many areas have been used in children

including buttocks, thighs, upper arms, abdomen, scrotum, soles, etc. but scalp appears to be superior as a donor site as proven by many leading pediatric burn centers [1–6].

Following the experience of others, although presented in a limited number of publications [1,4–6,8,10–13,16,18,19], in conjunction with our own dissatisfaction when using alternative donor sites, we decided to select the scalp to be the primary donor site for our patients. We also decided to introduce early contact therapy for scar therapy/prevention. This prospective study was established for a better evaluation of a long term esthetic and functional results of our new protocol.

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## 2. Patients and methods

This study included 123 children, 73 boys and 50 girls treated at the Department of Surgery and Urology of Children and Adolescents, Medical University of Gdansk, during the years 1998–2008 who underwent skin grafting due to deep burns or other post-traumatic skin defects. The patients were aged from 4 months to 15 years with a mean age of 35.8 months/2.98 years. All patients underwent at least one procedure for skin grafting. The scalp was used as a primary donor site unless its use was contraindicated (burned, infected, containing other pathology, e.g. an extensive haemangioma). In such cases the scalp served as the secondary donor site. All children had skin types from 1 to 4 according to Fitzpatrick [7].

The procedure was performed following the same protocol: the head was shaved in the morning of surgery; skin was treated with an alcohol disinfectant and adrenalin solution 1:250,000–1:500,000 was injected subgaleally to facilitate harvesting of wider grafts and to minimize bleeding. After marking the hairline, grafts were harvested with the Zimmer Electric Dermatome (Zimmer Holdings Inc., Warsaw, IN, USA). Their thickness depended on the age of a child according to de Viragh and Meuli: for small children from 1 month to 7 years 0.2 mm (0.008 inch) was used and for older children from 7 to 16 years – 0.3 mm (0.012 inch) [8]. Bleeding was stopped by applying pressure with adrenaline solution soaked gauze. Donor site was covered with Bactigras (Smith & Nephew Inc., Hull, UK) fixed with sutures (Fig. 1). Sutures were removed on the 4th/5th postoperative day during the first dressing change performed under general anesthesia. As the donor site healed the dressing separated spontaneously (Fig. 2).

All children started early contact therapy for scar management using adhesive contact media; Hypafix (BSN Medical), porous fixation tape, was applied immediately after healing of the recipient site. Unsatisfactory response to Hypafix was an indication for the introduction of silicone gel or sheeting. Therapy continued until the scar maturity, usually requiring at least 12 months of treatment. Scars of the recipient site were evaluated at the end of treatment according to the Vancouver Scar Assessment Scale (Table 1) [9].

## 3. Results

In the years 1998–2008 125 procedures for split skin grafting from the scalp were performed in 123 children. In 118 patients



Fig. 1 – Scalp covered with “Bactigras” after harvesting.



Fig. 2 – Healed donor site.



Fig. 3 – Hypertrophic scar within the donor site.

(96%) scalp was used as the primary donor site. In 2 cases (1.6%) grafts were taken twice from the same place. 5 patients (4%) had contraindications to use scalp during the first operation, but it was used in subsequent procedures as the secondary donor site.

In all patients the donor site healed between the 7th and 10th postoperative day. Considering donor site complications: 2 patients (1.6%) developed small areas (3–4 cm<sup>2</sup>) of alopecia, 5 patients (4.0%) had pressure-sores of the scalp located outside of the donor site area, 1 patient (0.8%) developed a hypertrophic scar within the donor site (Fig. 3). In 1 patient (0.8%) the graft was taken slightly beyond the hair line due to a technical

Table 1 – Vancouver Scar Assessment Scale [9].

Pigmentation	0 – Normal 1 – Hypo 2 – Hyper
Vascularity	0 – Normal 1 – Pink 2 – Red 3 – Purple
Pliability	0 – Normal 1 – Supple 2 – Yielding 3 – Firm 4 – Banding 5 – Contracture
Height	0 – Flat 1 < 2 mm 2–2 mm < and >5 mm 3 > 5 mm

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