Preputial skin can be used in all boys with burns requiring grafting

Sünnet derisi, greftlenmesi gereken bütün erkek yanıklı çocuklarda kullanılabilir

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BACKGROUND
In patients with extensive burns, all unburned areas can be used as donor sites. In male patients with small burns, preputial skin graft may be a good choice in order to avoid donor site problems.

METHODS
We retrospectively reviewed 12 patients treated in our burn center from January 1997 to August 2007 with preputial skin grafting.

RESULTS
In three patients, preputial skin was the only graft source. In nine patients, other donor sites were also used for split-thickness graft harvesting. In two patients, preputial skin graft was used for periareolar grafting where hyperpigmented healing was preferred. In the rest of the patients, preputial skin graft was used on various parts of the body. Overall success rate for preputial skin graft was 100%. There was no early donor site morbidity.

CONCLUSION
Preputial skin is a full-thickness, highly elastic and easy-to-harvest graft that should be considered in all burned male children in whom grafting is needed.

Key Words: Burn; circumcision; children; graft; preputium.

AMAÇ
Geniş alanlı yanıkları olan hastalarda, yanık olmayan bütün deri kısımları donör alanı olarak kullanılabilir. Donör saha problemlerini engellemek için, sünnet derisi kullanımı düşük yanık yüzdesi olan hastalarda iyi bir seçenek olabilir.

GEREÇ VE YÖNTEM
Ocak 1997 ile Ağustos 2007 tarihleri arasında yanık merkezimizde tedavi edilen ve greft uygulanan 12 hasta geriye dönük olarak değerlendirildi.

BULGULAR
Sünnet derisi üç hastada tek başına, dokuz hastada diğer donör alanlardan alınan greftlerle birlikte greft olarak kullanıldı. İki hastada sünnet derisi hiperpigmentasyonla sonuçlanan iyileşmenin tercih edildiği periareolar bölgede, diğer hastalarda vücudun farklı bölgelerinde kullanıldı. Sünnet derisi grefti için başarı oranı %100 idi. Donör alan morbiditesi gözlenmedi.

SONUÇ
Sünnet derisi oldukça esnek ve alınması kolay olan tam kat bir grefttir. Greft ihtiyacı olan bütün erkek yanıklı çocuklarda uygulanması düşünülmelidir.

Anahtar Sözcükler: Yanık; sünnet; çocuklar; greft; sünnet derisi.

In patients with extensive burns, all unburned areas can be used as donor sites. However, in small burns, selection of donor site can be problematic. Since all donor sites scar to some degree, it is advised to take skin from an area that will be otherwise hidden under most circumstances.[1] In patients with small burns, preputial skin graft (PSG) may be a good choice in order to avoid donor site problems. In addition, PSG may be used more liberally in populations where circumcision is a traditional obligation. In this study, we report our patients in whom PSG was used in their burn wound treatment.

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MATERIALS AND METHODS

We retrospectively reviewed 12 patients who were treated in our burn center from January 1997 to August 2007 and who were grafted with preputial skin (Table 1). All patients were under the age of 14 (mean age: 3.7 years). Mean total burned surface area was 19.3% (2-40%). Scalding was the cause of burn injury in 10 patients.

Written informed consent was obtained from all patients' family members prior to surgery. Except for one patient who only underwent circumcision and grafting, general anesthesia was used in all patients. During the operation, we performed circumcision first, and took split-thickness skin graft from the appropriate sites, if needed. Loose connective tissue and internal epithelial layer were removed from the PSG. Average size of the PSG was 6 x 4 cm and nearly 25 cm^2 (Fig. 1). Tangential excision was performed to burned areas until viable tissue was reached. Grafts were meshed, if needed. Preputial skin and split-thickness skin grafts were placed to the recipient area. Mean operative time was 65 minutes. On the postoperative fifth day, dressings were removed from the grafted area. Circumcision area was left open after 24 hours. Median postoperative length of hospital stay was 19 days (2-97 days).

RESULTS

In three patients, preputial skin was the only graft source. Dorsal area of the right foot, dorsal surface of the left arm and ventral surface of the right hip (Fig. 2) were the recipient areas of PSG. In nine patients, other donor sites were also used for split-thickness graft harvesting. Buttocks and thighs were the first two choices for donor sites, if appropriate.

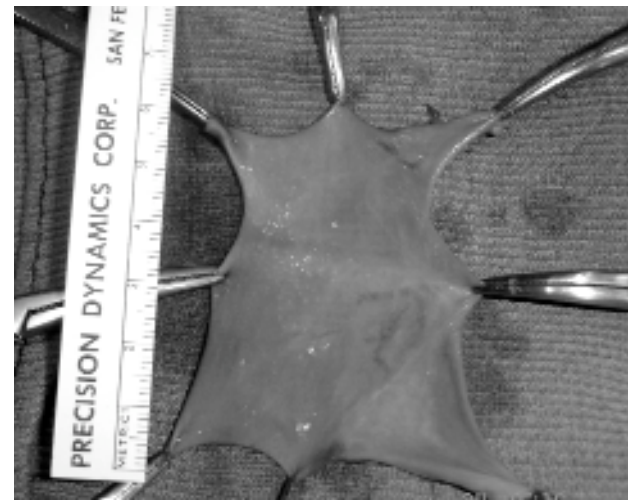

Fig. 1. Figure showing PSG measuring 6 x 4 cm.

In two patients, PSG was used for periareolar grafting where hyperpigmented healing was preferred (Fig. 3). In the rest of the patients, PSG was used in various parts of the body. There was no PSG loss or morbidity due to circumcision. Overall success rates for PSG and split-thickness skin grafts were 100% and nearly 90%, respectively. There was no early donor site morbidity.

DISCUSSION

Modern treatment of deep partial- and full-thickness burns includes operative debridement with subsequent skin graft coverage. Currently, a nearly 95% success rate is the standard of care for skin grafting.[2] For this success, adequate wound bed preparation, careful selection of donor sites, and appropriate perioperative care are critical. From these factors, careful selection of donor sites is important as donor site problems may occur.

Table 1. Patient data and details about surgery

Number	Age (year)	Cause of burn injury	Total burned surface area (%)	Anesthesia	Split thickness skin graft	Preputial skin graft recipient area	Postoperative length of hospital stay (day)
1	14	Electrical	5	General	+	Dorsal area of right foot	23
2	3	Scald	30	General	+	Anterior trunk	18
3	1	Scald	2	Local/sedation	-	Dorsal area of right foot	3
4	2	Scald	30	General	+	Anterior trunk	22
5	3	Scald	30	General	+	Right periareolar area	35
6	2	Scald	20	General	+	Posterior trunk	25
7	3	Scald	10	General	+	Right leg	11
8	2	Scald	20	General	+	Left periareolar area	20
9	4	Scald	40	General	+	Right leg	97
10	5	Flame	20	General	+	Bilateral periareolar area	12
11	4	Scald	20	General	–	Right hip anterior	5
12	1	Scald	5	General	–	Right shoulder	11

Fig. 2. Anterolateral surface of the right hip that was grafted using only PSG.

Preputial skin is a full-thickness and expandable graft that can be easily harvested and used. Additional advantages of PSG are: they do not need donor site care, do not cause scarring, the donor site is hidden, and the PSG can be harvested with simple surgical instruments. However, as with any surgical procedure, bleeding and infection are probably the most common complications of circumcision.[3,4] Other complications include hematoma formation, diffuse swelling, pain from inadequate anesthesia, and tearing of the sutures due to erection before healing is complete. Urethral injury and penile necrosis are exceptional but reported complications.[4] These complications decrease with experience and can be as low as 0.034% in those centers where circumcision is routinely performed.[5] In our patients, there was no complication related to circumcision.

In Turkey, more than 99% of the inhabitants are Muslim. Circumcision is thus the most common surgical procedure in boys for religious and cultural reasons. It is routinely performed in all male children with a very low complication rate. In addition, it may have some medical benefits such as improved hygiene and reduced risks of urinary and sexually transmitted infections and of penile and cervical cancer. However, opponents deny or minimize these benefits and put forward the complications of circumcision and loss of penile sensation.[5] We believe that, in burn patients, the benefits of PSG outweigh the potential complications of circumcision.

There are also some absolute medical indications for circumcision, such as phimosis secondary to balanitis xerotica obliterans and recurrent balanoposthitis, which occur in 1.5% and 1% of boys, respectively. Relative indications of circumcision are paraphimosis, phimosis, preputial pearls, redundant foreskin, hypospadias surgery, prevention of human immunodeficiency virus infection, and prevention of penile cancer.[3,5]

There are two additional reports by Yildirim and Chlihi et al. about the use of PSG in patients with burns.[6,7] They used PSG successfully in their burn patients with excellent results. Preputial skin is also used in other skin defects that need grafting and in contracture release.[6-9] These authors also strongly advise the liberal use of PSG.

Fig. 3. Appearance of PSG applied to bilateral periareolar area, where hyperpigmented healing is desirable.

It has been reported that PSG may heal with mild hyperpigmentation.[6] However, this may be an advantage if used in special sites such as the periareolar area. In our three patients who were grafted in the periareolar area, good cosmetic results were achieved.

In conclusion, preputial skin is a full-thickness, highly elastic and easy-to-harvest graft that should be considered in all male children with burns that need grafting. In small burns, it has the advantage of not disrupting any healthy skin area for graft harvesting. It can be also used for late burn reconstruction, release of contractures and in other related surgical procedures. Circumcision should be offered to all young males with burns in whom auto-grafting is needed.

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