Guideline on the use of Skin Substitutes in the Management of Burn Injured Patients

This document provides a framework for the use of skin substitutes in burn injured patients in the South West UK Burn Care Operational Delivery Network (SWUK ODN).

The framework provides a number of criteria that burn services should follow to ensure a safe management of Burn injured patients within the SWUK ODN.

1. Introduction

1.1 Patients who have sustained extensive burn wounds may require skin substitutes in addition to autografting to achieve early closure of burn wounds, thus improving their chances of survival.

1.2 There are a number of skin substitutes which have been developed over the last 20 to 30 years, some of which are no longer in production.

1.3 These guidelines will focus on the common types of skin substitute that are used within the burn services within the SWUK ODN.

2. Temporary Skin Substitutes

Biological

Cryopreserved Cadaveric allograft

2.1 Cadaveric allograft is obtained from a skin bank where the donor has been fully screened for a number of viral and bacterial diseases. The product is freeze-dried thus preserving approximately 90% viability when it is defrosted. Once defrosted it must be used. Further freezing is not possible. If the product is not used it has to be discarded.

2.2 Criteria for usage:

- Coverage of widely meshed autograft either as a sheet graft or meshed 1:1.5 (sandwich technique);
- Coverage of excised burn wound.

2.3 Cadaveric allograft will “take” like the patient’s own skin graft, but is a temporary covering. When used to cover widely meshed autograft, no further grafting may be necessary as the patient’s own autograft expands as the allograft is rejected.

2.4 When used to cover an excised burn wound it will need to be replaced with autograft eventually.
Synthetic

**Biobrane®**

2.5 Biobrane® consists of a silicone membrane bonded to a nylon mesh to which peptides from a porcine dermal collagen source have been bonded to the nylon membrane to form a flexible and conformable composite dressing.¹

2.6 Criteria for usage:
- Can be used for:
  - Donor site dressing;
  - Dressing for superficial partial thickness burns;
  - Temporary dressing following excision of burns.

2.7 Exclusion Criteria:
- Infected Burn wounds;
- Patients whose religious/cultural background forbids contact with porcine tissue.

3. **Permanent Skin Substitutes**

**Integra®**

3.1 Integra® is a dermal regeneration template consisting of bovine collagen, chondroitin-6-sulphate and a silastic membrane.² The dermal template becomes incorporated by revascularisation and the silastic membrane requires to be replaced with the patient’s autograft once the dermal component has developed sufficient vascular ingrowth.

3.2 Inclusion Criteria:
- Any patient who may survive their burn Injury;
- Patients who have a burn area >25% TBSA;
- Consultant Decision.

3.3 Exclusion Criteria:
- Patients whose survival is deemed to be impossible with our current level of knowledge and experience;
- Burn wounds which are known to be heavily colonised as a result of their injury or first aid given (for example, burns sustained and extinguished by rolling around the ground or dirty water);
- Patients with known behavioural problems which affect their compliance with treatment;
- Patients whose religious/cultural background forbids contact with bovine tissue.

3.4 Site criteria:
- All sites can be considered except:
  - Perineum;
  - Groins;
  - Axillae.
**Reconstructive Burn Surgery**

3.5 Inclusion Criteria:

- Patient has been assessed by Physiotherapy/Occupational Therapist to determine and document physical ability;
- Sites which can be functionally improved by excision of previous scarring and application of Integra®;
- Patient is able and willing to comply with treatment.

3.6 Exclusion criteria:

- Patients who deliberately and recurrently self-harm;
- Patients with known behavioural problems which will affect their compliance with treatment;
- Patients who are known not to comply with treatment.

**Autograft Cell Suspension**

3.7 This technique developed by Professor Fiona Wood, cultures small autograft skin biopsies into skin cell suspensions over several weeks.

3.8 The skin cell suspensions are then sprayed on to meshed autograft skin grafts to speed up the healing of the interstices of the graft.

**Matriderm®**

3.9 This is a matrix of bovine type I collagen with elastin which is used for dermal regeneration. It is applied to a vascular wound bed following which an autograft is immediately applied. Matriderm® experimentally has been shown to reduce wound contracture and in case studies has been shown to improve the elasticity of the skin graft.

3.10 Inclusion criteria:

- Full thickness or deep dermal burn wounds;
- Chronic burn wounds;
- Unstable burn scars;
- Burn contractures.

4. **References**

1. Biobrane®

2. Integra®

3. MatriDerm®