

Scalp Reconstruction

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Scalp Anatomy



◆ Layers

- ◆ Hair bearing skin
- ◆ Subcutaneous
- ◆ Frontalis/Occipitalis/Galea
- ◆ Subgaleal fascia
- ◆ Periosteum
- ◆ Bone inner and outer table
- ◆ Dura and venous sinuses

Reconstructive Ladder



- ◆ Healing by secondary intention
- ◆ Direct closure
- ◆ Grafts split and full thickness
- ◆ Flaps
 - ◆ Local
 - ◆ Regional
 - ◆ Free
- ◆ Tissue expansion

Aims of Reconstruction



◆ Why?

- ◆ Healing – primary healing
- ◆ Function – hair growth, skull protection.
- ◆ Form – appearance, shape
- ◆ Prevention of Complications exposed bone, infection, haematoma, CSF leaks etc

Principles



- ◆ Simplest technique that provides for the aims.
- ◆ Match scalp thickness with reconstruction
- ◆ Respect hairlines if possible
- ◆ Be consistent with the patients overall health and well being

Approach to Reconstruction



- ◆ What is missing? What problems will this loss cause?

- ◆ What am I trying to achieve by reconstructing?
 - ◆ What will provide the best outcome for this patient?

- ◆ What reconstruction will provide the best solution to this problem?
 - ◆ Must have a wide reconstructive armamentarium

- ◆ What is the time frame. Do I have time for tissue expansion. Is the patient accepting of this.

SSG vs FTSG

Pros

Cons

SSG

- ◆ Easy take
- ◆ Large area available

FTSG

- ◆ More durable
- ◆ Better colour match
- ◆ Better contour

- ◆ Thin fragile covering
- ◆ Poor contour
- ◆ Donor site

- ◆ More difficult take
- ◆ Limited donor area
- ◆ Limited size graft





Local Flap vs graft

Pro

Con

Flap

- ◆ Good contour
- ◆ Hair bearing
- ◆ Heals well
- ◆ Will cover bone
- ◆ More durable

- ◆ Technically more difficult
- ◆ Limited size of hole able to be closed with no secondary graft

Graft

- ◆ Easier technically
- ◆ Will cover larger areas

- ◆ No hair growth
- ◆ Poor contour
- ◆ Donor site
- ◆ Less durable



Local flap reconstruction



- ◆ Aims
 - ◆ Single stage
 - ◆ Avoiding a secondary donor site graft where possible
 - ◆ Form
 - ◆ Restore normal hair position if possible
 - ◆ Contour

Local Flap Reconstruction



◆ Principles

- ◆ Careful design to avoid errors resulting in the need to graft
- ◆ Suture galea where possible - multi layer closure
- ◆ Avoid/reduce dog ears by design and careful flap inset
- ◆ Bevel cuts in hair bearing skin to preserve hair follicles

Rotation Flap



- ◆ True rotation
- ◆ The larger the defect the larger the flap
- ◆ Sufficient scalp laxity
- ◆ Beware thin hair and scarred scalps
- ◆ Ensure the base of flap as no scars across base



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Design variations



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Double
opposing
scalp
rotation
flap

Staggered scalp rotation flap



Scalp Rotation flap and Burrows triangle



- ◆ Outer excision is much smaller and always tighter

Transposition flap and graft donor site



- ◆ Make sure the flap reaches
- ◆ Make the flap larger (esp. wider) than you think
- ◆ Minimize you dog ear

Tissue expansion



- ◆ Excellent technique for non acute coverage.
 - ◆ Localized alopecia, Sebaceous naevus etc
- ◆ Technique
 - ◆ Size of expander
 - ◆ As large as possible
 - ◆ Rate of expansion.
 - ◆ As fast as tolerated, and not to cause alopecia or necrosis.
 - ◆ Location of incisions and port.



Skull Defects – Aims of Reconstruction



Is skull replacement necessary? Is it in the patients best interest?

Skull Replacement

- ◆ Aims
 - ◆ Form - restore contour
 - ◆ Function – strength
 - ◆ Longevity of reconstruction
 - ◆ Minimize side effects/ complications

Skull Reconstruction – Principles



- ◆ Replace like with like – i.e. bone or similar to bone
 - ◆ Problems are strength (of bone substitutes), availability of bone, donor area for bone
- ◆ Replace shape and immobilise plate
- ◆ Provide vascularised cover – Flaps –local or free
- ◆ Techniques
 - ◆ I use Methyl Methacrylate cement with Gentamycin.
 - ◆ Generally free flap coverage.

Dural Defects



◆ Aims

- ◆ Seal the dura to prevent a CSF leak where possible
- ◆ Beware the Sagittal Sinus

◆ Principles

- ◆ Careful suturing
- ◆ Careful positioning of the craniotomies so there is a dural edge to suture to.

Have a good neurosurgeon who you work well with, who does good work and listens.

Radiotherapy



- ◆ Causes a progressive atrophy of all tissue and bone.
- ◆ Need to tailor reconstruction to allow for changes with radiotherapy.
- ◆ Need to plan that further reconstruction may be necessary many years later.

Timesh plate and incipient exposure



Summary



- ◆ Remember the aims and principles.
- ◆ Enjoy the challenge of reconstructing an endless variety of defects.
- ◆ Think creatively.