

Membranes and Bone Grafting Materials

Principles
of
Bone Grafting

Gaining Bone Height
is more difficult
than gaining Width

Prevent Soft Tissue In-growth

- Soft Tissue develops Quicker than New Bone
- Soft Tissue must be prevented from growing into a Potential Graft Site

Prevention of Graft Infection
is Essential

Prevention of Bone Grafting Infection

- Antibiotic Cover
- Mix Antibiotic with Graft Material
- Good Flap Design to allow Good Flap Closure

Antibiotics to mix with Graft
Material

Amoxicillin Powder for Injection

Antibiotics to mix with Graft Material

Add Antibiotic to Dish before
Graft Material

Causes of
Bone Grafting Infection
Poor Sterile Technique
Loss of Post-operative Flap Integrity

Principles of Maintaining Good Flap Integrity

- Good Blood Supply
- Remote Incisions where Possible
- Passive Closure without Tension
- Good Suture Technique
- Flap Protection during Healing

Principles of Maintaining Good Flap Integrity

- Passive Flap Closure
- Prevent Haematoma Formation
under Flap (Periodontal Dressing)
- Protect Flap with Periodontal Dressing

Decortication Definition

- The preparation of a bony surface
- to facilitate the union of a bone graft to a recipient

The Purpose Decortication

To initiate a Repair Response by
connecting the Graft to the Blood Supply
of the Cancellous Bone
of the Recipient Site

The Principle of Decortication

Damage to bone initiates

Repair and Remodelling

Decortication Technique

- Thin Cortical Plate use a Sharp Instrument
- Dense Cortical Plate use a 2 Round Bur

Decortication Technique

- Density of Bone
- Thickness of Bone
- Quality of Bone

Decortication
in the Anterior Maxilla
Usually possible using
a Sharp Pointed Instrument

Decortication
in the Posterior Maxilla

Beware piercing into the Maxillary
Sinus

Decortication
in the Anterior Mandible
Use a 2 Round Bur

When decorticating
in the Posterior Mandible
Protect the Mental Nerve

Decortication

- Anterior Maxilla
- Posterior Maxilla
- Anterior Mandible
- Posterior Mandible

Bone Grafting Complications

- Infection
- Partial Loss of Graft
- Total Loss of Graft
- Loss of Some Original Bone

Autogenous Grafts

Graft taken from One Site
to Another in Same Individual

Autogenous Bone



Menu



Storing Autogenous Bone

- Store in a Saline Solution with Nutrients
- Water kills Bone

Intraoral Sites

- Implant Socket Site
- Adjacent to Socket Site
- Ridge Alveoloplasty
- Mental Symphysis
- Ramus Area
- Maxillary Tuberosity

Extra oral Sites

- Hip
- Radius
- Tibia
- Rib
- Skull

Disadvantages of using Autogenous Bone

- Morbidity at Donor Site
- Cost

Allogenic Grafts

Graft taken from Another Individual
of the Same Species

1965

Study begins utilizing
Antigen Matched
Frozen Bone
and Irradiated Bone

Hyatt & Schallhorn

Menu



Irradiated Bone



Mixed with
Antibiotic



Menu



The Most Effective Available Bone
Graft Material
is Irradiated Cancellous Bone

Irradiated Bone



Menu





Menu



Donor Screening

Menu



Donor Profile

- Sex, Age
- Cause of Death
- Time of Death
- Refrigeration Time
- Tissue Recovery Time

Menu



Sex, Age

- Relevant on Weight Bearing Grafts
- Not to Particulate Grafts
- Between 15 and 75

Donor Profile

- Sex, Age
- Cause of Death
- Time of Death
- Refrigeration Time
- Tissue Recovery Time

Menu



Tissue Recovery Time

- If not refrigerated within 12 hours
- must be recovered within 15 hours

Tissue Recovery Time

- If refrigerated within 12 hours
- Must be recovered within 24 hours

Menu



Frequency of Use

- In USA 800-900,000 Grafts per Year using Material from Donors

Donor Tissues Used

- Corneas
- Skin
- Heart Valves
- Veins
- Tendons and Ligaments
- Bone

Bones Used

- Vertebra
- Arm Bones
- Leg Bones (Long Bones)
- Hip Bone (Iliac Crest)

Treatment of Weight Bearing Bone Tissue

- Disinfected
- Cannot be sterilized
- Cross-matching necessary

Treatment of Bone Tissue

- Bone is to be used in a Weight bearing situation
- Fresh Frozen
- Cannot be Irradiated or Ethylene Oxided

Treatment of Particulate Bone Tissue

- Treated with Gamma Radiation
- 2.5 – 3.8 Mega Rads
- Kills any Bacteria and Funguses

Graft Materials

- Autogenous Bone
- Best Graft Material
- Harvesting of Autogenous Bone
not Justified with Abundance
of Available Graft Materials

- Irradiated Cancellous Bone
- Demineralized Freeze Dried Bone
- Calcium Phosphate Materials
(Multiple Choices)

Menu



Irradiated Cancellous Bone
is replaced with New Bone
more rapidly and effectively
than DFDB or Calcium Phosphate
Graft Materials

Menu







Menu





Menu



Demineralized Freeze Dried Bone



Menu



Demineralized Freeze Dried
Bone
is very Unpredictable

Menu



Lamella Bone



Menu



1984

Irradiated Cancellous Bone
and Demineralised Freeze Dried
Bone
Became Available Commercially

Menu



Tri-Calcium Phosphate TCP

Study
started 1980



Commercially
available 1983

Menu



1983

Hydroxyapatite

&

Tricalcium phosphate

available

Menu



Osteogen



Resorbable
Calcium Phosphate

Menu



Interpore 200

Hydroxyapatite

Menu



Xenografts

Graft taken from Another Species

Menu



Soft Tissue Barriers

Resorbable Non-resorbable

Menu



Objectives of Soft Tissue Barriers

To prevent In-growth of Soft Tissue
while New Bone is Forming

Menu



Non-Resorbable Membranes

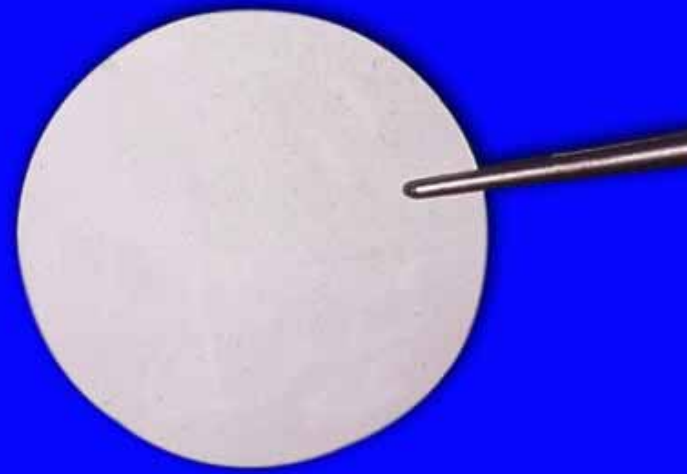
Menu



MilliPore Filter

1965

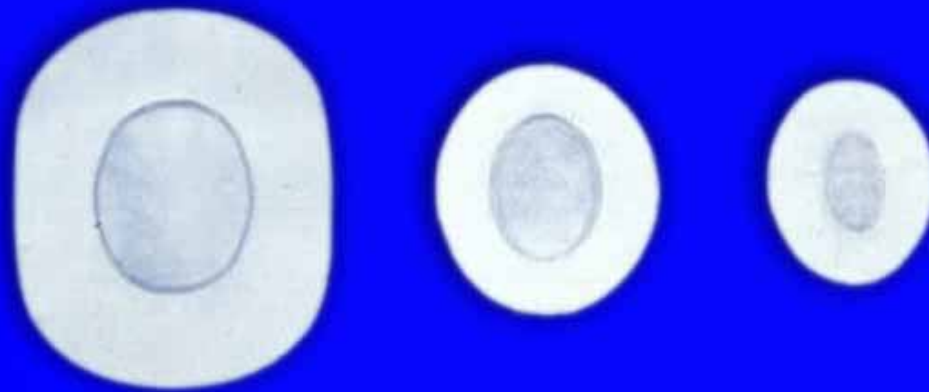
Boyer



Menu



Gore-Tex



Menu



Resorbable Membranes

Menu



Collatape



Menu



Bio-Guide



Menu



Biomend

- More Rigid
- Easier to handle in Most Circumstances

The End