The role of Human Amniotic Membrane in acute and chronic wounds

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Human Amniotic Membrane

• 1910 Davis used fetal membranes as a skin substitute
• It has been a popular Biological dressing for  
  ▪ Burns  
  ▪ Acute and chronic wounds  
  ▪ Chronic leg ulcer including vascular  
  ▪ Diabetic foot
**Human Amniotic Membrane**

- In Head, Abdominal, Pelvic and Cardiac surgery for prevention of tissue adhesions
- In Dental surgery for dental sockets
- In Gynecology for reconstruction of neo vagina
- In Neurosurgery for dura repair
- In Ophthalmology for variety of cases

**HAM-Histology**

Human amniotic membrane or Amnion is the upper most non adherent Ectodermal layer of placenta that is facing the fetus

**Human Amniotic Membrane**

- It has a single layer of Cuboidal Epithelial Cells, Thick Basement Membrane and Avascular Stromal Tissue that is loosely attached to Chorion
- It has certain specific characteristics:
  - Non Immunological reaction due to lack of HLA-A, HLA-B, HLA-C and DR antigens
  - It also has cell migration and growth promoting activity like Cytokines, Growth factors, Protease inhibitors
  - Preserved at -80°C for up to 2 years
  - It has an antimicrobial activity
Protocols- General

- Seronegative donors & recipient
  - HBV, HCV, HIV 1, HIV 2, Syphilis & HTLV
- Consent from Donors and Recipients
- Harvesting techniques
- Cleaning & preparation methods
- Blood & Rh Group
- Patient selection criteria
- Dressing protocols
- Follow-up
- Results

Human Amniotic Membrane

Study

Two Centers
- King Fahad Armed Forces Hospital Jeddah
- King Fahad General Hospital (MOH) Jeddah

We have done 68 cases

- Diabetic Foot  35
- Crush Injuries  07
- Burn  14
- Pressure Ulcer  08
- Post operative  04

Cases
Case 1: 59 year old male
Diabetic, Hypertensive, Hyperlipidemic, PVD post right femoropopliteal bypass. Ankle Brachial Index on right 0.9 and left 0.8
Right 5th toe amputation. Non healing wound at lateral dorsal foot
X-ray foot: no bone infection. Wound culture negative
We applied HAM
Follow up was 2 times a week.

Case 2: 64 year old male
Diabetic, Hypertensive, Hyperlipidemic
Wound at dorsum of right foot since 2 years
Ankle Brachial Index on right 0.9 and left 1
Extensive debridement +/- amputation was suggested in outside hospital
After initial wound management we offered him HAM
Follow up was 2 times a week
At one year

Case 3: 59 year old male
Diabetic, Hyperlipidemic, Hypertensive. Infected wound at left 5th toe since 1 week
Ankle Brachial Index on right 0.9 and left 1. X rays no bony involvement. Culture no significant growth.
Debridement was done
After initial wound management we offered him HAM
Follow up was 2 times a week

Case 4: 45 year old male
Diabetic, Hypertensive. Wound at dorsum of right foot since 4 weeks. Ankle Brachial Index on right 0.9 and left 1
X-rays no bony involvement. Culture no significant growth.
No debridement was done
We offered him HAM
Follow up was 2 times a week

Follow up at 6 months

Follow up was 2 times a week.

Follow up was 2 times a week.

Follow up was 2 times a week.

Follow up was 2 times a week.

Follow up was 2 times a week.

Follow up was 2 times a week.
Case 5: 83 year old male
Diabetic, CVA, bed ridden, Hypertensive. Pressure Ulcer at Sacrum stage 3 to 4. It was no bony involvement.
Culture moderate growth of E. coli. Initial Debridement was done and standard measures were used to treat ulcer.
More than 3 months wound did not heal. We offered him HAM. Dressing change was twice a week with VAC application.

Week 0 | Week 5

Case 6: 9 year old male
Road side accident. Crush injury to right foot on medial aspect. Skin loss, exposed tendons and fractures of 1st metatarsal bone.
Consultation was made and we started HAM. Same week patient was discharged.
Follow up was 2 times a week.

Week 0 | Week 12 | At 6 months

Case 7: 27 year old male
Post RTA. Lacerated Wound Rt. Arm. HAM was applied. Dressing change was 2 times a week.

Week 0 | Week 10

Human Amniotic Membrane (HAM) - Conclusion

- Facilitates epithelialization
- Maintains a normal epithelial phenotype
- Infection and rejection of graft are very rare
- Reduces scarring
- Reduces tissue adhesion
- Reduces exudate
HAM-Conclusion

- Inexpensive
- Widely available
- Easy to harvest
- Easy to apply
- Applied one to 2 times per week

References

- Effectiveness of human amnion preserved long term in glycerol as a temporary biological dressing- Burns 25(1999) 625-635. 4) Evaluation of lyophilized, gamma irradiated amnion as a biological dressing- Cells and Tissue Banking 5:73-80,2004

Thank you