

DAWN OF REGENERATION

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INTRODUCTION

The extracellular matrix (ECM) is a complex network of protein, glycoprotein and polysaccharide that serves as a physical scaffold for mechanical support of tissues. It also plays a vital role in regulating cell behaviors in migration, differentiation and proliferation. Over the past few decades there has been an increase in usage of engineered ECM for tissue regeneration and wound healing. These engineered ECM are derived from synthetic or natural sources, tailored to mimic native ECM. Here we present a case of using Myriad Matrix™, an ovine based engineered ECM in coverage of a lower limb wound.

CASE PRESENTATION

A 35 years old man with no comorbidities previously, presented with an undisplaced right tibial open fracture after getting involved in a road traffic accident. He underwent an emergency surgery to have his fracture stabilized by an external fixation device. Unfortunately, the wound over the open fracture site became infected, requiring debridement in operating theater. After debridement, 3 cm tibial bone was exposed. He was then referred to Plastic & Reconstructive Surgery department for wound coverage.

Proceeded for wound debridement and coverage with ovine based ECM (Myriad Matrix™) (Figure 1)

Figures 2 - 4 shows progression of wound over 1 month period whereby wound epithelized



Figure 2: One week post product application

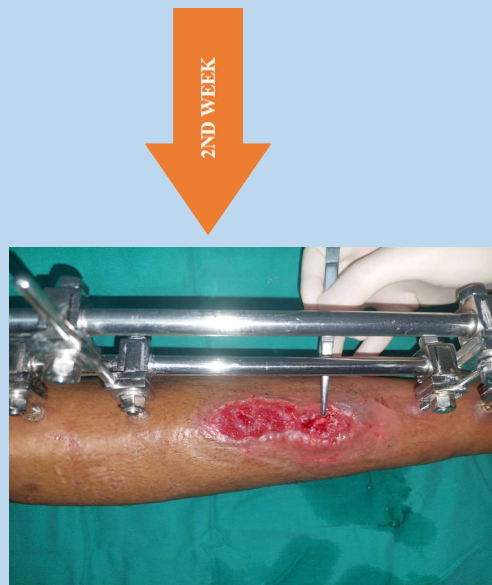


Figure 3: Three weeks post product application, healthy granulation tissue covering the wound with remaining 0.5cm bone exposed (indicated by forceps)
Preemptive removal of product due to local infection with pseudomonas.

CONCLUSION

In conclusion, engineered ECM holds tremendous potential in wound healing and tissue regeneration. While using engineered ECM has many advantages it also poses its own set of challenges in terms of high cost, limited availability and potential complications. Therefore the usage of engineered ECM should be made on case to case basis taking into account patient needs and medical expertise. More research into development and competition in the industry would see increased role of engineered ECM in wound management and tissue regeneration.

REFERENCES & ACKNOWLEDGEMENT

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Figure 1: Post wound debridement (right) and application of Myriad Matrix™ (left)

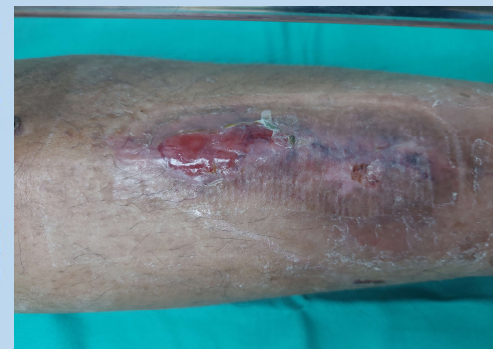


Figure 4 Epithelized wound after one month application



DISCUSSION

1) Improved wound healing

- Engineered ECM helps to provide a scaffold for cells to attach, proliferate and differentiate into a new tissue more rapidly. It also promote angiogenesis improving wound healing and reducing scar formation. This leads to a better cosmetic outcome and reduce risk of scar contracture for patients.

2) Zero donor morbidity

- As the wound is able to be healed by secondary intention with the aid of engineered ECM, the patient avoids another major surgery for wound coverage. This negates the risk of donor site morbidity present in tissue transfer.

3) Regulation

- the lack of standardization of production of ECM may lead to a variability in performance based on product used.
- medical professionals require comprehensive understanding of wound management, tissue coverage and regeneration to ensure appropriate use of engineered ECM to prevent potential patient morbidity.

4) Cost

- Manufacturing of ECM involves complex processes which requires significant resources, specialized facilities and trained personal leading to a high price point. This limits its accessibility especially in public funded hospitals.

