# Case series of Complex Diabetic Foot Ulcers treated with Acellular Fish Skin

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## **INTRODUCTION:**

Treatment of diabetic foot ulcers has seen great advantages in treatment with combination of offloading, moist wound healing, skin substitutes and negative pressure devices. However the the treatment for complex wounds with exposed avascular tissue such as bone, tendon or capsule are still lacking.

Wounds with exposed bone or tendon are a major reconstructive challenge in wound care.

These wounds are often treated with free tissue transfer or local flap coverage in order to achieve adequate soft tissue coverage. 1 Using skin flaps in the lower leg has limited use due to donor site considerations and scarring. 2

Deep diabetic foot ulcers are prone to infections and deep infections such as osteomyelitis are limband life threatening with approximately 8% of ulcers being resolved through amputations.3

In this case series we explore the use of a novel acellular fish skin graft with favorable structure, porosity and fatty acids for promoting healing and bridging of granulation tissue over exposed structures.

Minimally processed acellular fish skin uniquely retains soluble molecules and fatty acids through its processing cycle and does not undergo any chemical or mechanical crosslinking.

This results in maintaining the skins natural porosity and micromolecule environment favorable for cell ingrowth and wound healing. This has been reported to have significant impact on deeper wounds with the cell ingrowth favoring fast and healthy buildup of granulation tissue.4

### References: 1:

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# METHODS

**OBJECTIUVE:** Investigate the efficacy of Acellular Fish Skin in reducing and resolving complex lower extremity chronic wounds.

## MATERIAL AND METHODS:

Retrospective analysis of 3 consecutive patients with complex ulcers with exposed bone, tendon or capsule. Wounds had been non-responsive to previous treatments or required surgical amputation prior to treatment. Infected wounds were treated until infection was no longer purulent and gangrenous tissue was amputated. Then the fish skin was applied until full granulation was achieved in the wound. The fish skin was covered with Negative pressure wound dressing for the first weeks of application while the wound had a concave surface to ensure contact with wound bed and manage drainage. Then the area was dressed with 4x4s, Kerlix, Ace and secured.

# **RESULTS:**

All three patients achieved 100% healing without further amputation or severe infections.

The product provided quick granulation coverage of the exposed avascular structures. Healing then progressed full epithelialization

### **CONCLUSION:**

Treatment of complex diabetic foot ulcers continues to be a challenge even in the specialized wound care center. In wounds with poor perfusion and history of recurrent infections or osteomyelitis the acellular fish skin provides a novel treatment option to achieve fast granulation coverage, barrier to further infections and promote healing of avascular tissue wound beds.

# **RESULTS**

	WOUND STATUS	AREA	WAGNER GRADE	APPLICATIONS	TIME TO HEAL
W1	Gangrenous L 4th and 5th toes	6 x 3 cm (18cm2)	4	5	15 weeks
W2	Charcot foot.Bilat heel wounds. Ostemyelitis	8 x 3 cm (24cm2)	3	13	31 weeks
W3	Post 5th ray resection, visible bone to 4th mt head	7 x 4 cm (28cm2)	2	5	17 weeks

## REPRESENTATIVE WOUND







2. Week 3



3. Week 10



4. Week 11