Wound Healing with Platelet Rich Plasma

HealthSouth Rehabilitation Hospital of Utah
Mindy Mitchell MN, DBA, FACHE, CRRN and Peggy Riedesel PT, CWCS

HEALTHSOUTH®

Wound Healing: a Complex and Dynamic Process

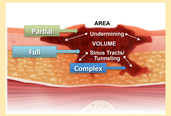
Wound healing follows a well-defined sequence of biochemical and cellular processes orchestrated by platelets,

- **Platelets** control key aspects of tissue repair (wound healing).
- **Fibrinogen** and **thrombin** lead to clot formation.
- **Cytokines** and **chemokines** are released from platelets to summon immune cells and attack foreign substances within wounds.
- **Platelet derived growth factors** lead to generation of new tissue to fill the wound
- Extracellular matrix composed of platelets and plasma provides a scaffold for cells to adhere

Treatment Approaches by Wound Severity

Partial thickness
- AutoloGel®
- Advanced wound dressings
- Skin substitutes

GOAL To maintain moist wound bed and promote closure



Complex - full thickness with exposed structures - [bone, tendon, joint, blood vessels, hardware]
- AutoloGel
- NPWT
- Surgery

GOAL To promote perfusion and formation of granulation tissue to cover exposed structures

Full thickness with undermining, sinus tracts/ tunneling
- AutoloGel
- Negative-pressure wound therapy (NPWT)

GOAL To promote perfusion and formation of granulation tissue to fill the wound, undermining, sinus tracts and tunneling

Evidence Based Practice AutoloGel - Bioactive Platelet Rich Plasma (PRP) Gel

In a prospective, randomized, blinded, multi-center, controlled trial for 2.2 weeks, with 2.8 AutoloGel applications: 81.3% were healed, versus the 42.1% control in the most commonly sized diabetic foot ulcers.

The clinical relevance of treating chronic wounds with an enhanced near-physiological concentration of PRP gel:
- Two hundred Patients were surveyed, 285 wounds total, with 48.1 weeks of mean wound duration (no healing).
- 2.2 weeks
- 2.8 AutoGel applications
- 96.5% showed positive response
- 90.5% of wounds had volume reduction of 63.6% or greater

In a retrospective, longitudinal study to evaluate healing lower extremity wounds:
- Thirty-nine patients were surveyed, 40 wounds, with Wagner grade III & Wagner grade IV ulcer classifications.
- Severe ischemia was found 60% of wounds in patients with ASO.
- 83% of wounds were healed.

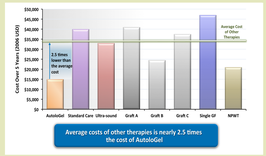
AutoloGel Reports Reduced Costs Compared to NPWT in Complex Wounds

When AutoloGel was applied to 25 wounds, 17 of the 25 wounds would have received NPWT according to standard practice.
- NPWT calculated based on daily rental rate: two canisters and medium black dressing for each patient over the course of seven days verses AutoloGel cost
- Cost difference estimated: Savings of $7809 or greater than $450 per patient
- Authors noted that time to make and apply PRP averages ~1/2 the time required for NPWT.

Treatment	# of Patients	Unit[a]	Cost/Unit[b]	Total
AutoloGel	17	34	$540.00	$18,360
NPWT	17	41.31	$633.49	$26,169

[a] Unit defined as one AutoloGel combination kit or estimated for NPWT as weeks of treatment per patient times the number of patients for NPWT.
[b] Costs based on 2013 pricing for AutoloGel combination kit. NPWT cost based on 2010 pricing.

Direct Wound Care Costs Lower in AutoloGel-Treated Patients

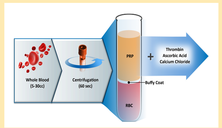


Dougherty, Edward. An Evidence Based Model Comparing the Cost-Effectiveness of Platelet Rich Plasma Gel to Alternative Therapies for Patients With Non-Healing Diabetic Foot Ulcers. Advances in Skin and Wound Care, 2008;21:568-75

History

AutoloGel: FDA cleared (2007)
- Autologous
- IP-protected gel formulation
- Indicated for all exuding wounds
- Restarts healing from within the wound

Preparation Process



Indications for Use

The AutoloGel system is used at point-of-care for the safe and rapid preparation of PRP gel from a small sample of a patient's own blood.

Under the supervision of a healthcare professional, the PRP gel produced by the AutoloGel is suitable for exuding wounds, such as leg ulcers, pressure ulcers, diabetic ulcers and for the management of mechanically or surgically-debrided wounds.

Components of Bioactive AutoloGel: A Patient-Specific Wound Treatment

Platelets
- Growth Factors
- Cytokines and hemokines
- Antimicrobials

Plasma
- Coagulation proteins
- Protease Inhibitors
- Fibrinogen and albumin

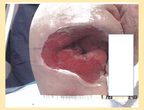
Additives
- Ascorbic Acid
- Calcium
- Chloride
- Thrombin

Our Experience

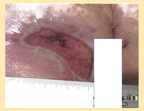
Patient History
- Male, 54
- Admitted November 7, 2013
- Admitted for: critical illness myopathy and a urinary tract infection
- Prior history: T11 partial paraplegia secondary to traumatic fall.

Wound history:
- Stage II right ischial tuberosity
- Stage III midback
- Unstageable left heel
- Stage IV left ischial tuberosity

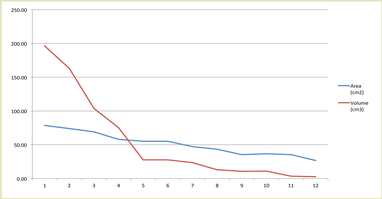
Plan of Care
Initial plan was conservative treatment:
- Gauze dressings
- Sharp debridement
- NPWT



PRP therapy was initiated on December 27 to promote healing specifically of the left ischial tuberosity wound.



Timeline of Interventions



Measurements Over Time

Date	Length	Width	Depth	Area (cm²)	Volume (cm³)
12/27/2013	11.5	8.0	2.5	72.26	180.64
12/30/2013	11.5	8.0	2.2	72.26	158.96
1/3/2014	11.0	8.0	1.5	69.12	103.67
1/10/2014	11.0	6.7	1.3	57.88	75.25
1/17/2014	10.5	6.7	0.5	55.25	27.63
1/23/2014	10.5	6.7	0.5	55.25	27.63
1/30/2014	10.0	6.0	0.5	47.12	23.56
2/6/2014	9.7	5.7	0.3	43.42	13.03
2/10/2014	9.0	5.0	0.3	35.34	10.60
2/13/2014	9.0	5.2	0.3	36.76	11.03
2/20/2014	9.0	5.0	0.1	35.34	3.53
2/28/2014	8.5	4.0	0.1	26.70	2.67

References

De Leon, JM, Driver, V R, Fylling, CP, Carter, M J, Anderson, C, Wilson, J, Dougherty, R M, Fuston, D, Triugilia, D, Valenski, V, Rappl, LM. (2011). The clinical relevance of treating chronic wounds with an enhanced near-physiological concentration of platelet-rich plasma gel. Advances in Skin & Wound Care, 24(8):357-366.

Dougherty, E J. (2008). An Evidenced-based model comparing the cost-effectiveness of patelet-rich plasma gel to alternative therapies for patients with nonhealing diabetic foot ulcers. Advances in Skin & Wound Care, 21(12), 568-575.

Driver, V. R., et. al AutoloGel Diabetic Foot Ulcer Study Group. (2006). Ostomy Wound Manage, 52(6), 68-87.

Sakata, J, Sasaki, S, Handa, K, Uchinl, T, Saski, T, Higashita, R, Tsuno, N, Hiyoshi, T, Imakado, S, Morimoto, S, Rinoie, C, Saito, N. (April, 2012). A retrospective, longitudinal study to evaluate healing lower extremity wounds in patients with diabetes mellitus and ischemia using standard protocols of care and platelet-rich plasma gel in a Japanese wound care program. Ostomy Wound Management, pp 36-47.

Wilson, J. and Branch K., (2011). Calculating Saved Costs When Using Platelet-Rich Plasma Gel in Place of NPWT in 17 Complex Wound Patients. Symposium on Advance Wound Care.