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An investigation into the incidence, causes, progression and treatment of pre-tibial lacerations in the elderly

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BACKGROUND

Pre-tibial lacerations (PTL) are a relatively common injury, affecting the elderly, which has long been recognised as requiring specialist hospital intervention, with various treatments explored (Crawford & Gipson 1977, Sutton & Pritty 1985, Budny et al. 1993, Silk 2001, Bradley 2001).

There is an increasing clinical question of how best to treat PTLs, prevent readmission, address non-healing, reduce complications and reduce the burden they pose for primary care resources.

Elderly patients with pre-tibial lacerations are a vulnerable patient group and often have significant comorbidity and impaired mobility prior to their injury. A pre-tibial injury in an elderly person can lead to a decrease in mobility, confidence and independence.

Soft silicone dressings* have been shown to be effective in: pain management and reduction (Dahlstrom 1995, Davies & Ripon 2008); reduction of healing time (Bugmann et al. 1998, Gotschall et al. 1998); reduction of adherence to wound bed, reduction of time needed to remove the dressing and bleeding (Dahlstrom 1995); reduction of scar formation (Gotschall et al. 1998); and reduction of overall costs for wound healing (Zepmsky et al. 2005, Rippon et al. 2008).

PURPOSE AND HYPOTHESIS – AIMS

- To establish incidence of PTLs in NHS District Hospitals
- To investigate the cause and progression of PTLs
- To evaluate current practice in the management of PTLs in the A/E Department and primary care

METHODS

- Literature review
- Prospective, time-limited, clinical case series observation of current practice and management of PTL, including healing time, complications, and infection rates in a cohort sample
- Current protocols were assessed for implementation and practice, and recordings made of interventions delivered
- Data collected in the A/E department and followed up in the community via district nurse reporting and computer based patient records

References: Bugmann P, Taylor S, Gyger D, Lironi A, Gerin B, Vunda A, La Scala G & Birraux C. (1998) A silicone – coated nylon dressing reduces healing time in burned paediatric patients in comparison with standard sulfadiazine treatment: a prospective randomized trial. *Burns*; 24; 609-612. Crawford, B.S., Gibson, M. (1977) The conservative management of *pre-tibial* lacerations in elderly patients. *Br J Plast Surg*; 30: 2, 174-176. Dahlstrom KK. (1995) A new silicone rubber dressing used as a temporary dressing before delayed split skin grafting. *Scan J Plast Reconstr. Hand Surg*. 29; 325-327. Davis, A., Chester, D., Alison, K., Davidson, P. (2004) A survey of how a region's A&E units manage *pre-tibial* lacerations. *J Wound Care*; 13: 1, 5-7. Davies P, & Rippon M. (2008) *Evidence review: the clinical benefits of Safetac technology in wound care.* MA Healthcare Ltd, London. Dunkin, C.S.J., Elfleet, D., Ling, C., Brown, La H.(2003) A step-by-step guide to classifying and managing pretibial injuries. *J Wound Care*; 12: 3, 109-111. Gotschall CS, Morrison MI, & Eichelberger MR. (1998) Prospective, randomized study of the efficacy of Mepitel on children with partial-thickness scalds. *Journal of Burn Care Rehabilitation*; 19; 279-283. Lamyman, M J; Griffiths, D (2006) J.A. Davison, Delays to the definitive surgical management of pre-tibial lacerations in the elderly. *Plastic Surgery;15;9; 422-424*. Ramnani, S.R., Weston, *P. A.M.* (1980) Pretibial flap wounds: early grafting under regional anaesthesia as an outpatient procedure. Injury; 12: 360-364. Rippon M, Davies P, White R & Bosanquet M. (2008) Cost implications of using an atraumatic dressing in the treatment of wounds. *Journal of Wound Care*; 17; 5; 224-227. Sutton, R., Pritty, P. (1985) Use of sutures or adhesive tapes for primary closure of pretibiallacerations. *Br Med J*; 290: 1627. Tandon, S.N., Sutherland, A.B. (1973) Pretibial lacerations. *Br J Plast Surg*; 26: 2, 172-175. Zempsky WT, Zehrer CL, Lyle CT, Hedbloom EC. (2005) Economic comparison of methods of wound closure strips vs. sutures and wound adhesives. *International Wound Journal;* 2;3; 272-281.

Table 1: Demography of the sample: past medical history. Age x : 82. M:F 1:23

Disease	Healed (n=16)	%	Not Healed (n=8)	%	Total Sample (n=24)	%
Cardiac						
Heart Failure*	1	6.3	1	12.5	2	8.3
Atrial Fibrilation*	2	12.5	0	0	2	8.3
Myocardial Infarction*	0	0	1	12.5	1	4.2
Ischaemic Heart Disease	5	31.3	1	12.5	1	25
Vascular						
Peripheral Vascular Disease*	1	6.3	0	0	1	4.2
Hyperlipidaemia*	1	6.3	0	0	1	4.2
Hypertension	3	18.8	3	37.5	6	25
Stroke	2	12.5	5	62.5	7	29.2
Respiratory						
COPD	5	31.3	2	25	7	29.2
Asthma	3	18.8	3	37.5	6	25
Other						
Dementia*	2	12.5	1	12.5	3	12.5
Type II Diabetes*	1	6.3	1	12.5	2	8.3
Renal Failure*	2	12.5	1	12.5	3	12.5
Cancer*	2	12.5	1	12.5	3	12.5
Osteoporosis*	2	12.5	1	12.5	3	12.5
Previous History of Falls*	1	6.3	1	12.5	2	8.3

Table 2: Demography of the sample: drug history

Medication	Healed (n=16)	%	Not Healed (n=8)	%	Total Sample (n=24)	%
Cardiovascular						
Antianginal*	2	12.5	0	0	2	8.3
Cardiac Glycoside*	2	12.5	0	0	2	8.3
GTN*	0	0	1	12.5	1	4.2
Ca2+ Channel Blocker*	2	12.5	1	12.5	3	12.5
Aspirin	8	50	3	37.5	11	45.8
ACE Inhibitor *	0	0	1	12.5	1	4.2
B-Blocker *	1	6.3	1	12.5	2	8.3
Statin	6	37.5	3	37.5	9	37.5
Diuretic	6	37.5	5	62.5	11	45.8
Mental Health						
Antidepressant	5	31.3	2	25	7	29.1
Benzodiazepine	3	18.8	1	12.5	4	16.7
Analgesia/Anti-Inflammatory						
Analgesic	3	18.8	1	12.5	4	16.7
Paracetamol*	2	12.5	0	0	2	8.3
Inhalers						
Salbutamol	4	25	2	25	6	25
Salmeterol	2	12.5	2	25	4	16.7
Anticholinergic	2	12.5	2	25	4	16.7
Steroid	3	18.8	1	12.5	4	16.7
Other						
Ferrous Sulphate	3	18.8	2	25	5	20.8
Calcium Carbonate	3	18.8	2	25	5	20.8
Levothyroxine*	1	6.3	2	25	3	12.5
Laxative*	1	6.3	1	12.5	2	8.3
PPI	3	18.8	2	25	5	20.8

Table 3: Incidence, progression and treatment of PTL in the sample

Outcome	n	%
Incidence	24	1.824 (per 1000 admissions to A/E
Wound type:		
– V shaped	15	62.5
– Linear laceration	6	25
– Multiple laceration	2	8
– Abrasion	1	4
Depth:		
– Dermis	14	58
– Subcut. Fat.	8	33
– Fascia	2	8
Wound Cleaned	14	58
Steri-stripped	21	87.5
Silicone dressing	9	37.5
Bandage	11	46
Community treatment:		
– Silicone	7	29
Soft silicone –	12	50
Progression:		
– Healed <20days	6	25
– Healed <50days	6	25
– Healed <100days	6	25
– Healed < 120 days	2	8
– Not healed	4	17

CONCLUSION

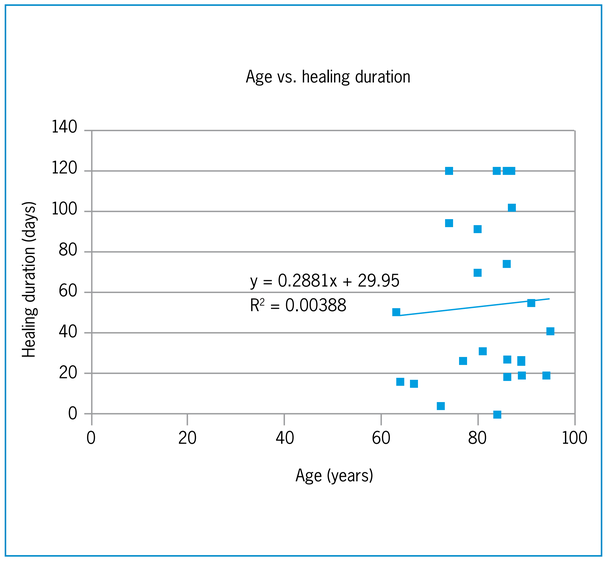
Cause of PTL was either as a consequence of falling or accidental injury.

Further analysis of the prospective study data is required to establish treatment changes as patients progress from acute to primary care services.

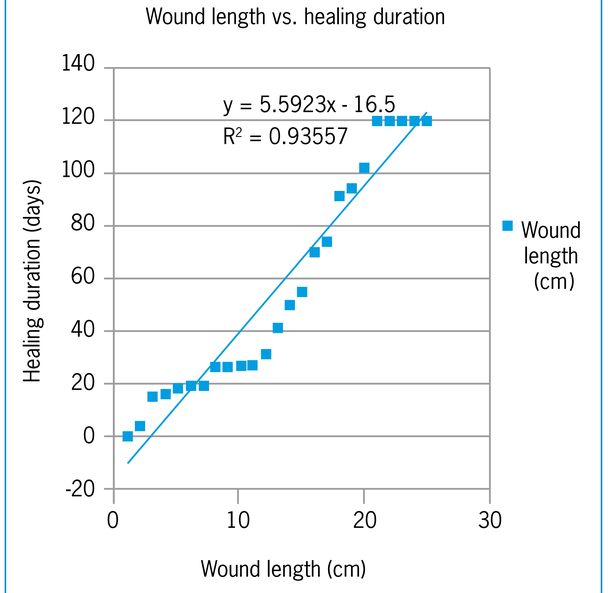
There is a possibility that healing duration is affected by wound length.

While incidence is low, the potential for high cost and intensive service intervention in those patients who do not readily heal is high.

Graph 1: Correlation of age vs. duration of PTL.



Graph 2: Correlation of wound length vs. healing duration of PTL



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*Soft Silicone Dressings = Mepitel® and Mepitel® One.