Author's response to reviews

Title: A case of Resolution of a recurrent ischial pressure ulcer with a novel tissue adhesive

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Author's response to reviews: see over
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A case of Resolution of a recurrent ischial pressure ulcer with a novel tissue adhesive

Dr. med. Ingo Kuhfuss, Alessandro Cordi, Priv.-Doz. Dr. med. habil. Philip Zeplin

First Reviewer's report
Title:A case of Resolution of a recurrent ischial pressure ulcer with a novel tissue adhesive
Version:4Date:26 October 2014
Reviewer:Lawrence Charles Parish
Which of the following following best describes what type of case report this is?:None
Has the case been reported coherently?:No
Is the case report authentic?:Yes
Is the case report ethical?:Yes
Is there any missing information that you think must be added before publication?:Yes
Is this case worth reporting?:No
Is the case report persuasive?:No
Does the case report have explanatory value?:No
Does the case report have diagnostic value?:No
Will the case report make a difference to clinical practice?:No
Is the anonymity of the patient protected?:Yes
Comments to authors:
A case report about the use of a commercial product does not cut muster
Level of interest:An article of limited interest
Quality of written English:Needs some language corrections before being published
Declaration of competing interests:
'I declare that I have no competing interests'

We find it difficult to respond to Reviewer 1’s comments, given that he seems to bring into question the value of case reports presenting technological developments. Advances in surgical technique often begin with this type of report and we believe that they can be of great value to the surgical community. We have not made any modifications to the paper based on his feedback.

Second Reviewer's report
Title:A case of Resolution of a recurrent ischial pressure ulcer with a novel tissue adhesive
Version:4Date:28 October 2014
Reviewer:Severin SL Laeuchli
Which of the following following best describes what type of case report this is?:Other
If other, please specify:
promising new treatment for a common disease
Has the case been reported coherently?: Yes
Is the case report authentic?: Yes
Is the case report ethical?: Yes
Is there any missing information that you think must be added before publication?: Yes
Is this case worth reporting?: Yes
Is the case report persuasive?: Yes
Does the case report have explanatory value?: Yes
Does the case report have diagnostic value?: No
Will the case report make a difference to clinical practice?: Yes
Is the anonymity of the patient protected?: Yes

Comments to authors:
This case report presents an interesting new treatment strategy for a common problem. The discussion is a bit short - it would be interesting to add some information about the tissue glue that was utilised (Properties, what it is made of, etc.) and to elaborate a bit more on the mechanism of action.
Level of interest: An article of importance in its field
Quality of written English: Acceptable
Declaration of competing interests:
I declare that I have no competing interest

We have added the following to the discussion section to further describe the technology and why its characteristics are relevant to our search:

In a recently concluded retrospective review of 23 patients in our own institution with Stage III and IV pressure sore repair with myocutaneous and fasciocutaneous flaps we found that 8 (34.8%) required revision surgery, with 3 of these requiring 2 or more procedures. While not inconsistent with literature reported rates, this need for revision surgeries represents an enormous burden on the patients and their families as well as on the health care system and hospital staff.

As part of our efforts to seek techniques or technologies to reduce this recurrence rate, we have analyzed the primary causative factors leading to the need for revision procedures. The underlying, often systemic wound healing deficits are exacerbated by 2 factors: 1) shear forces which cause movement of the flap with respect to the underlying tissue, thereby impeding or interrupting the formation of a collagen matrix; and 2) the accumulation of fluids in the dead space between the tissue planes, which leads to a physical separation of the planes, thereby preventing tissue repair and normal healing. Our search for solutions therefore has been focused on approaches which can effectively hold the two planes in close approximation for the duration of the proliferative phase of wound healing – in these patients often significantly longer than the 3-21 days normally cited for this phase.

Fibrin-based technologies have been extensively studied and have not been shown to be effective as adhesives for large flap fixation. The facts that the fibrin clots formed do not have a high shear strength and are generally broken down within a few days through fibrinolysis suggest that they may be inappropriate for this particular indication. Techniques of mechanical closure such as quilting sutures have also been studied by many and have generally been found to be effective [Kuroi 2006 Breast Cancer]. Suturing techniques however are often not feasible in these wounds due to compromised tissue quality, poor vascularization and the risk of focal point necrosis. A high strength tissue adhesive which is biocompatible, non-inflammatory, resorbable and with a duration of effect of several weeks would correspond to the need.
The adhesive in question is a one-part lysine-based urethane pre-polymer, which cures in the presence of moisture. It is applied immediately prior to flap closure using a custom applicator which delivers precisely measured droplets in a grid pattern on the substrate tissue plane. The adhesive drops begin curing on contact with moisture but the process is slow – taking up to 45-50 minutes to reach full strength. There is therefore no need to rush the process of flap closure. Care should be taken to avoid smearing the drops during closure and then gentle pressure is applied across the entire flap surface to ensure contact and elimination of dead space. We also take care to avoid pulling the flap as suture knots are tied and avoid any other movement that could interrupt the bonds during the first 40-50 minutes after application.

The fully polymerized adhesive droplets maintain their properties of adherence to the tissue for 4-12 weeks, after which they are slowly broken down through a process of hydrolysis into lysine, CO2 and very small amounts of alcohol and polyols (sugars). Complete resorption can take as long as 24 months. In the event that a revision of a flap is required, drops of adhesive are likely to be identifiable in the wound bed and can be separated from the tissue plane without damage. Re-application of the product in the secondary closure would not be recommended.