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Efficacy of secondary intention healing for scalp defects—Case series from a single institution

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Abstract

Background/Objectives: As surgical techniques evolve, there remains underutilisation of secondary intention healing as a valid reconstruction option. This is largely due to concerns regarding inferiority of wound cosmesis, increased downtime with wound healing and infection risk (*Dermatol Surg*. 2020; **46**(12): 1492–97).

Methods: We sought to look at the outcome of secondary intention healing in a cohort of patients seen at a private dermatology practice with small to medium sized scalp defects. All patients completed a satisfaction survey that further evaluated its feasibility.

Results: Excellent cosmetic outcome was noted with secondary intention healing for small to medium scalp defects, specifically in patients with thinning scalps that allowed healing without patchy alopecia.

Conclusions: Secondary intention healing should be considered as a reconstructive option for scalp defects, especially in the right patient cohort.

KEYWORDS

medium wounds, scalp defects, secondary intention healing, small wounds, wound healing

INTRODUCTION

Secondary intention healing (SIH) remains a valid primary reconstructive option for scalp defects, despite its underutilisation. Often, there are concerns regarding cosmetic inferiority of the wound coupled with increased downtime and infection risk. Hence, precedence is set for wounds to be closed primarily or with a flap or graft repair.

SIH has been long utilised for patients unwilling or medically unfit for surgery and in wounds, where healing has been complicated by dehiscence, infection or necrosis. More often, the cosmetic outcome of SIH in such scenarios proves to be better than that anticipated by the patient and clinician themselves.[1] In Australia, the lack of Medicare funding associated with SIH further disincentives its use as a primary means of reconstruction.

The scalp remains a particular site where surgical repairs can prove to be challenging. This anatomical site generally lacks mobility and requires extensive undermining even with primary closures. Given the rich vascular anastomoses, repairs can be time-consuming, particularly if the undermining is not in the sub-galeal plane due to excessive bleeding. Flaps on the scalp often require oversizing and grafts leave patients with a depressed alopecic scar and a secondary defect.

There is a paucity of data in the current literature regarding the use of secondary intention healing as a

reconstructive option for the scalp. Hence, we sought to look at its outcome in a series of patients where small-to-medium scalp defects.

METHODS

A total of 10 patients with small-to-medium-sized scalp defects were evaluated from a private dermatology practice. We classified wounds <2 cm as small defects and those >2 cm but <5 cm as medium-sized defects.

All patients underwent excision for primary keratinocyte cancers. Participants provided a written consent for the purpose of the study. They were also requested to complete a survey questionnaire with further appraised their satisfaction with the healing process and the cosmetic outcome.

A standard dressing regime was used in all cases for the SIH.

1. Jelonet (petrolatum impregnated gauze), algisite (haemostatic calcium alginate), melonin (non-stick gauze) and hypafix (adhesive dressing) to the wound for the first 48 h
2. Application of Flaminil hydro, an alginate gel to the wound after 48 h
3. Cleansing of the scalp, with the application of Flaminil hydro and wound cover if needed for 7–10 days
4. Flaminil hydrogel as wound dressing after cleansing daily subsequently until the wound is fully granulated

A review of the wound was performed post-operatively at 48 h, 1 week, then fortnightly for a month then monthly until was wound healed.

RESULTS

All 10 patients completed the study without the need for revision with a flap or graft repair. The largest wound size measured 4.5×4 cm (Figure 1) and the smallest wound measured 1×1.5 cm (Figure 2). There were no cases of wound infection or hypergranulation. The healing time for wounds varied depending on the size and depth of the wound, coupled with patient factors. In our case series, smaller wounds generally healed within 3–4 weeks and medium wounds within 6 weeks. Complete healing was noted in all cases at 3 months.

From our observation, medium-sized wounds had a greater contraction, with a proportional decrease in surface area compared to the smaller wounds. This was not formally measured in our study but remains in congruence with the mathematical model of wound healing which occurs as a logarithmic function.[2] Due to increased contraction that occurs with larger wounds, a larger difference in wound size may in fact translate to a much smaller difference in healing time.[3]

Satisfaction survey

A satisfaction survey was also completed by all study participants (Data S1). Participants were asked to rate this based on five following factors—cosmetic outcome, dressing regime, pain associated with healing, effect on daily activities and whether SIH would be considered in the future. The cosmetic outcome was rated as excellent, good, fair and poor.

All patients completed the survey. 70% of the patients reported the cosmetic outcome as being excellent, and

FIGURE 1 Progression of healing in a medium scalp defect.

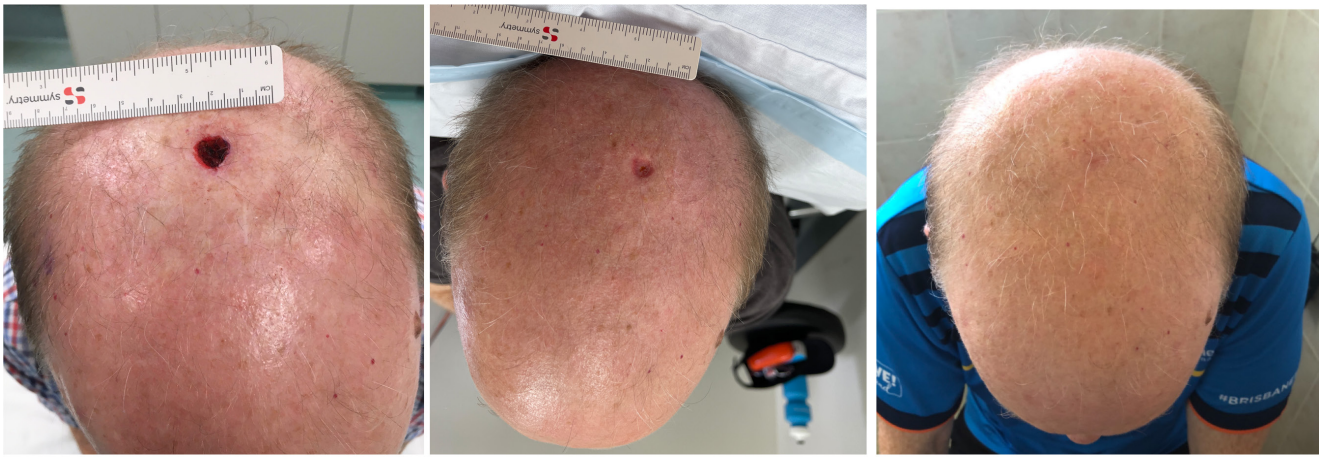

FIGURE 2 Progression of healing in a small scalp defect.

TABLE 1 Overview of satisfaction survey results from the patient cohort.

Patient no	Cosmetic outcome	Dressing regime not cumbersome	Healing process reasonably pain-free	Minimal effect daily activities	Consider SIH
1	Excellent	Agree	Agree	Agree	Yes
2	Excellent	Agree	Agree	Agree	Yes
3	Excellent	Agree	Agree	Agree	Yes
4	Excellent	Neutral	No answer	No answer	Yes
5	Excellent	Agree	Agree	Neutral	Yes
6	Good	Neutral	Agree	Disagree	Yes
7	Good	Agree	Agree	Neutral	Yes
8	Excellent	Agree	Agree	Agree	Yes
9	Excellent	Agree	Agree	Agree	Yes
10	Good	Agree	Agree	Agree	Yes

100% of the patients were willing to consider SIH for future scalp wounds. None of the patients reported pain associated with healing. The results of the survey are outlined in Table 1.

DISCUSSION

The utility of SIH in concave sites has been well established. In NEET areas (concave surfaces of the nose, eye, ear and temple), SIH can provide excellent cosmetic outcomes in the right patient cohort.[3] Despite this knowledge, SIH is not readily used for reconstruction due to the inability to predict cosmetic and functional outcomes[4] and hence the possibility of increased patient dissatisfaction.

SIH is a valid method of reconstruction especially in the scalp given the thick inelastic galea makes reconstruction particularly challenging. The vertex scalp often requires the recruitment of tissue from the more mobile parietal, temporal or anterior scalp.[5] Flaps in this area require significant oversizing to allow tissue recruitment and add to patient morbidity. A recent survey performed by Dermatological surgeons also supports this notion with SIH indications extending from concave sites to convex areas such as the scalp and anterior lower extremity.[6]

There are distinct advantages to using SIH for scalp defects. The lack of anatomical free margins on the scalp minimises tissue distortion and increases the predictability of wound healing. Tissue contraction that occurs with SIH afford wounds to heal by granulation, conferring better cosmetic outcomes in thinning or balding scalps. In our patient cohort, those with thinning and bald scalps clearly had superior cosmetic outcomes.

SIH is relatively pain-free compared to flap and skin graft repairs as granulating wounds have a moist environment. Compared to grafts and some flaps, it also allows

an earlier transition to work and daily activities. It is financially more cost-effective for patients as it mitigates the need for a flap or graft. It offers patients the flexibility of having a procedure in rooms rather than in the hospital. For the surgeon, it is a well-suited alternative for ill-defined cancers when Mohs is not readily available. It is a time-saving option for multiple scalp defects where reconstruction may be challenging. Furthermore, monitoring for recurrence in aggressive tumour subtypes or in high-risk individuals is more predictable as it does not obscure tumour margins which may occur with a graft or a flap.

The main disadvantage to SIH is the increased time associated with wound healing. Patients often need frequent follow up in the early stages of wound healing, especially when elderly with medical co-morbidities. This can add to time and material costs for the patient and the surgeon. There may be a need for wound revision in select cases, though contracted scar often does translate to smaller flap or graft repair compared to the original defect. Care also must be taken with darker skin types as often SIH can lead to hypopigmented scars which may be cosmetically inferior.

SIH has been associated with increased wound infection with literature showing higher rates of colonisation of both Staph Aureus and Pseudomonas species.[7] Furthermore, lower extremity posed the greatest risk.[7] There were no cases of wound infection in our patients' cohort. This may be due to differences in patient cohort and wound location. All our patients followed a wound protocol with the application of flaminil hydrogel, an alginate gel known to have auto-debriding and antibacterial properties. Nonetheless, to minimise infection risk, a nasal swab prior to the surgical procedure with appropriate topical decolonisation may be warranted.[8]

The cost of SIH in our patient cohort was comparable, if not less to a flap or graft repair. There was no need for a second or long-term dressing which is required for a graft or flap. The only additional cost was that of flaminil hydrogel which itself served as a wound dressing.

CONCLUSION

Our case series highlights a promising role for SIH in small-to-medium scalp defects. Excellent outcomes were noted particularly in the thinning vertex scalp with minimal morbidity. SIH should be considered a reconstructive option for small-to-medium scalp defects in the right patient cohort. The role of SIH in large scalp defects was outside the scope of our study, but future studies could be aimed at investigating its feasibility in the right patient population.

PATIENT CONSENT STATEMENT

Yes

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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