

Use of a novel adhesive suture retention device in primary closure of diabetic surgical sites

Introduction

A successful approach to limb salvage in patients with diabetes often includes surgical procedures designed to expedite healing by allowing for primary wound closure. Unfortunately due to various complicating factors, patients with diabetes who undergo surgery have an increased risk of wound dehiscence which prolongs healing time and may result in limb loss. In this study we investigate the use of a novel adhesive suture retention device (HEMIGARD ARS device; SUTUREGARD medical, Inc; Portland, OR) and its ability to improve healing rate, reduce healing time, and increase limb salvage.

Methods

This retrospective case series looks at five patients with diabetes who have undergone a variety of procedures utilizing an adhesive suture retention device (ASRD) during skin closure. All patients were medically complex with complications including a chronic wound, sensory neuropathy, peripheral arterial disease and/or chronic or acute infection, including osteomyelitis. All patients underwent primary closure when deemed appropriate by the senior author. Closure was assisted with the use of one or multiple ASRD devices.



Figure 1: A single ASRD strip

Case 1



Case 3



Case 4



Case 2



Case 5



Figure 3: Case 1- Plantar I&D; Case 2- Partial calcaneotomy; Case 3- 5th MPJ Resection; Case 4- Toe amputation; Case 5- TMA

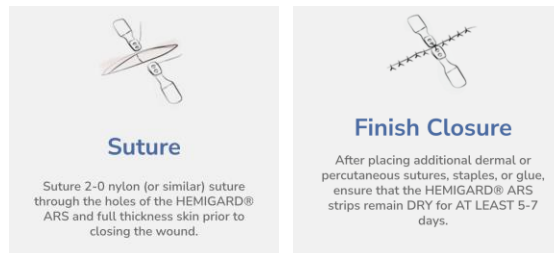


Figure 2: Outline of ASRD use (Source: suturegard.com)

Each ASRD pouch contains two single use strips. One strip is placed perpendicular to the wound edge on each side, keeping the leading hole approximately 1cm from the wound edge. Next, nylon suture is placed through the holes of the ASRD strips to close the wound. The skin surface must be cleaned and dried prior to application of the strip.

Results

Case 1: 66 year old male with a past medical history of DMII, CHF and MI who presented one week after stepping on a nail. Patient was found to have a large abscess at the plantar medial forefoot for which he underwent an incision and drainage on 03/04/2022. Patient was closed with assistance of ASRD on 03/08/2022 and sutures were removed on 04/15/2022

Case 2: 39 year old male with a past medical history of Type I Diabetes and recurrent bilateral ulcerations with multiple amputations who presented with a large heel ulcer with exposed bone and chronic osteomyelitis. Patient underwent a partial calcaneotomy and closure with assistance of the ASRD device on 02/08/2022. Sutures were removed on 03/25/2022.

Case 3: 65 year old male with a past medical history of DMII, HTN, obesity and CKD3 who presented with an ulceration at the 5th MPJ and osteomyelitis of the joint. He underwent resection of the joint and closure with assistance of ASRD on 05/04/2022. Sutures were removed on 06/02/2022.

Case 4: 65 year old male with a past medical history of DMII, HTN and anemia who presented with an infection of his 2nd toe amputation site. Patient underwent a debridement and closure of the site with assistance of the ASRD device on 04/12/2022. Sutures were removed 05/03/2022.

Case 5: 74 year old female with a past medical history of DMII and PVD for which she underwent revascularization who presented with a chronic ulceration at former surgical site. Patient underwent a trans metatarsal amputation on 04/12/2022 using her medial tissue for a flap and closure was assisted with the use of the ASRD device. Sutures were removed on 05/03/2022.

Discussion:

This retrospective case review demonstrates the use of the ASRD device in medically complex patient across various surgical sites. All patients in this case series underwent a challenging closure with the assistance of the ASRD device and had sutures removed at an average of 26.8 days. It is the author's opinion that by dispersing the stress of a standard suture away from the wound edge and creating high tension closure without skin ripping, ASRD provides a platform that can help avoid complications in this high risk population

References:

- Cole, Windy, et al. "Use of a novel adhesive suture retention device in lower leg excisional wound closure: a retrospective review." *WOUNDS-A COMPENDIUM OF CLINICAL RESEARCH AND PRACTICE* 33.9 (2021): 222-225.
- COLE, WINDY. "The Use of a Novel Suture Retention Device to Prevent Surgical Wound Dehiscence (SWD)." *JAAD case reports* 6.2 (2020): 109-114.
- Lear, William, Lacey L. Roybal, and Jamie J. Krusic. "Forces on sutures when closing excisional wounds using the rule of halves." *Clinical Biomechanics* 72 (2020): 161-163.
- Roybal, Lacey L., et al. "A novel adhesive suture retention device for the closure of fragile skin under tension." *JAAD case reports* 6.2 (2020): 109-114.
- Roybal, Lacey L., et al. "Use of a novel adhesive suture retention wound closure device to prevent patient follow-up visits during the COVID-19 pandemic." *JAAD case reports* 6.7 (2020): 593-597.