INTRODUCTION
Off-loading a pressure ulcer is essential in treating the neuropathic foot. Total contact casting (TCC) is the gold standard for off-loading plantar wounds with proven efficacy. However, TCC is widely underutilized nationwide and removable off-loading devices are more commonly used, though less effective. Our present case series of long standing wounds that were unresponsive to other care modalities that responded impressively once TCC was initiated.

PURPOSE
To illustrate how chronic plantar ulcerations that failed treatment with removable off-loading devices progressed to closure after initiation of Total Contact Casting (TCC).

OBJECTIVE
To obtain healing in chronic plantar ulcerations that persisted for more than one year.

METHODS
Three patients were identified with non-healing ulcerations of greater than one year duration; the longest being six years. Two patients' co-morbidities include diabetes and hypertension. All patients were morbidly obese with BMI ranging from 41.7 to 45.1. All patients presented with chronic plantar foot wounds that were unresponsive to other off-loading devices. All of these wounds were treated with a removable off-loading device. Full thickness biopsies were obtained on three separate occasions. The base ulcer present for 6 years. He had undergone multiple treatments prior to referral. Initial evaluation measurement at our institution was 2.7 x 3.0 x 0.6 cm (5.1 cm²). During his treatment course, he underwent nonremovable off-loading, wound biopsy and skin substitutes. The maximum wound measurement during treatment was 9.8 cm². TCC was initiated 7/11/14 at 1.4 cm x 1.2 cm x 0.2 cm (1.7 cm²). He remains under treatment, but currently measures 1.2 cm x 0.7 cm x 0.2 cm (0.8 cm²), half of his initial wound size at the beginning of the casting period.

RESULTS
The findings of all three patients utilizing the Roll on TCC system were impressive. Two patients' wounds completely closed after 2 months of Roll on TCC system. One of our patients' total wound area had decreased below one half of the initial measurement after four months of casting using our complete treatment. No complications were observed with the Roll on TCC system. This case series demonstrates that wounds that do not progress to healing with other methods of off-loading and advanced therapies did progress to closure once the Roll on TCC system was implemented.

CONCLUSIONS
The findings of all three patients utilizing the Roll on TCC system were impressive. Two patients' wounds completely closed after 2 months of Roll on TCC system. One of our patients' total wound area had decreased below one half of the initial measurement after four months of casting using our complete treatment. No complications were observed with the Roll on TCC system. This case series demonstrates that wounds that do not progress to healing with other methods of off-loading and advanced therapies did progress to closure once the Roll on TCC system was implemented.

Table 1: Initial wound size (cm²) and closure date

<table>
<thead>
<tr>
<th>Case</th>
<th>Initial wound size (cm²)</th>
<th>Initial cast date</th>
<th>Closure date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case 1</td>
<td>1.7</td>
<td>7/11/14</td>
<td>3/11/14</td>
</tr>
<tr>
<td>Case 2</td>
<td>5</td>
<td>7/21/14</td>
<td>9/26/14</td>
</tr>
<tr>
<td>Case 3</td>
<td>1.7</td>
<td>5/19/14</td>
<td>8/25/14</td>
</tr>
</tbody>
</table>

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Case 1 46 year old male with PMH of: morbid obesity (BMI 45.1), HTN, HLD, peripheral neuropathy and former tobacco use. He presented with chronic plantar foot wound measuring 1.4 cm x 1.2 cm x 0.2 cm (1.7 cm²). He remains unhealed, but currently measures 1.2 cm x 0.7 cm x 0.2 cm (0.8 cm²), half of his initial wound size at the beginning of the casting period.

Case 2 43 year old male with PMH of: PMH of: PMH of: diabetic foot ulcer since 7/2013 that had been present after a callus peeled off to reveal a base ulcer. He underwent multiple treatments including vacuum assisted closure, skin substitutes, surgical debridement, tissue biopsy and removable off-loading without significant progression to healing. The Roll on TCC system was initiated for this wound on 7/21/14 measuring 2.3 cm x 2.5 cm x 0.2 cm (5.9 cm²) with full healing achieved by 9/26/14 (11 weeks). The wound remains closed to date with five months of follow up.

Case 3 55 year old female with PMH of: diabetes, HTN, Charcot neuroarthropathy, Charcot neuroarthropathy with external fixator, active tobacco use and amputations right 4th and 5th toes for right plantar 5th metatarsal base ulcer present for 6 years. He had undergone multiple treatments prior to referral. Initial evaluation measurement at our institution was 2.7 cm x 3.0 cm x 0.6 cm (5.1 cm²). During his treatment course, he underwent nonremovable off-loading, wound biopsy and skin substitutes. The maximum wound measurement during treatment was 9.8 cm². TCC was initiated 7/11/14 at 1.4 cm x 1.2 cm x 0.2 cm (1.7 cm²). He remains under treatment, but currently measures 1.2 cm x 0.7 cm x 0.2 cm (0.8 cm²), half of his initial wound size at the beginning of the casting period.

S6/14

9/26/14

3/1/14

References:
2. Fife, C.E., Carter, M.J., Walker, D., Thomson, M.J., serving as an associate. All patients are morbidly obese with BMI ranging from 41.7 to 45.1. All patients presented with chronic plantar foot wounds that were unresponsive to other off-loading devices. All of these wounds were treated with a removable off-loading device. Full thickness biopsies were obtained on three separate occasions. The base ulcer present for 6 years. He had undergone multiple treatments prior to referral. Initial evaluation measurement at our institution was 2.7 cm x 3.0 cm x 0.6 cm (5.1 cm²). During his treatment course, he underwent nonremovable off-loading, wound biopsy and skin substitutes. The maximum wound measurement during treatment was 9.8 cm². TCC was initiated 7/11/14 at 1.4 cm x 1.2 cm x 0.2 cm (1.7 cm²). He remains under treatment, but currently measures 1.2 cm x 0.7 cm x 0.2 cm (0.8 cm²), half of his initial wound size at the beginning of the casting period.

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