### CASE STUDY

**OPEN DISTAL FEMUR FRACTURE**

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**PATIENT PROFILE**

<table>
<thead>
<tr>
<th>GENDER</th>
<th>PRESENTED WITH</th>
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<tbody>
<tr>
<td>Female</td>
<td>An open distal femur fracture sustained in a motor vehicle accident. The fracture was complicated by a previous total knee replacement. Surgery was delayed almost 24 hours due to other medical issues that needed to be addressed, increasing the risk of infection.</td>
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</tbody>
</table>

| AGE | 69 |

**TREATMENT**

The patient was taken to surgery where the wound was irrigated, debrided, and underwent retrograde intramedullary femur fixation. She was given 1 gram vancomycin 30 minutes prior to surgery, and to further reduce the bacterial load in the wound and reduce the risk of complications, 1.2 grams tobramycin and 1 gram of CellerateRx®/ CRXα® Surgical Activated Collagen® Powder were applied. The wound was closed and a wound vacuum-assisted closure (VAC) device was applied. The patient was placed on 1 gram vancomycin every 12 hours until the culture came back negative at 48 hours. During post-operative care, she was placed on a continuous passive motion machine and progressed to partial weight bearing. The patient was discharged to home on post-op day four. The fracture healed without any wound complications.

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**RESULTS**
RATIONALE FOR TREATMENT

Open fractures represent a unique challenge to treat. The injury causes soft-tissue destruction, which worsens in the immediate post-injury period because of the instability of the fracture and localized swelling. These tissues are exposed to the environment and the patient’s skin. Skin is colonized by bacteria, and the warm, moist environment of the open wound is a perfect culture medium for the propagation of these bacterium into a full-blown infection. These areas of devitalized, necrotic tissue have diminished blood flow, which makes it difficult to deliver adequate antibiotics to the site. Treatment of open fractures includes stabilization of the fracture, debridement of devitalized tissue, and IV antibiotics. There have been several methods used to address the bacterial contamination, including repeat debridement and application of local and systemic antibiotics. One method used to deliver local antibiotics is to combine the antibiotic with methyl methacrylate cement and make beads that are placed into the wound. Two problems with this method are: 1) There is only a small zone of bacterial kill around the beads, and 2) The beads require later removal. Because CellerateRx®/ CRXα® Surgical Activated Collagen® Powder is hydrophilic, it forms a gel as it absorbs fluids in the wound site that is then resorbed over 24 to 72 hours.