

Motorcycle Accident



Motorcycle Man

Case Report: Treatment of Complicated Surgical and Traumatic Wounds in One Patient

The objectives in caring for this patient were avoiding amputation of his leg, debridement of the wounds, protection against and treatment of infection, pain reduction healing of the wounds and providing as much comfort as possible.

By Jan Vandeputte, RN,MA,CNS. Infection control manager.

Dr. Sik Ham Lauw, MD, Plastic surgeon.

Dr. Remi Vandeputte, MD, Orthopedic surgeon.

Introduction

Complex traumatic wounds present tremendous challenge for the healthcare team. The dynamics of this exchange of energy will determine the magnitude of injury. Disruption of the body covering leaves the once-sterile underlying tissue exposed to contamination. The contaminants are derived from either the victim(endogenous) or the exogenous energy source. The presence of a contaminant such as bacteria makes the care of the wound an exercise in microbiology. Other contaminants, such as dirt, rocks, wood splinters, etc., also may reside in the recesses of the wound. Gustilo() followed up on the management of open fractures, and in his article noted that infection rates between 3% and 25% were described in the literature. In many of these cases gangrene is also eminent and in the first few weeks after injury even the life of the patient is at stake.

Even after stabilizing the patient and the wound, often multiple surgical procedures are needed to correct all of the problems of the damaged skin, tissue, and bone. At discharge the patient's ability to lead a normal life(without amputations) is the quality standard we should strive to achieve.

In all stages the wound care team has to perform according to the highest standards. Infection prevention and providing the ideal wound healing environment are top priorities.

Case presentation

A 24 year old Caucasian male had a high energy accident with his motorcycle on the 8th of July, 1995. He was admitted to the emergency room and upon examination, it was determined that his right knee was seriously injured and that his left tibia(leg) was broken together with severe loss of muscles tissue. (see Pic.1). There was considerable debate among the attending physicians when deciding whether to amputate the left leg or attempt to save it, because of the high potential for gangrene, which could result in

loss of the whole leg or worse. The decision was made to attempt to save the leg.

The patient was immediately scheduled for an operation for bone repair and wound cleaning. After cleansing of the wound, the broken left tibia was anatomically corrected with a pinless fixator(pic 2). The damaged tissue was positioned in place to the extent possible. The uncovered muscles were dressed with Epigard(Becton Dickinson) wound dressing. The right knee was placed in a temporary cast.

Two days after the operation it was obvious that some of the tissue was not healthy(pic. 2) Some doctors began to consider amputation again, since the leg had a terrible odor and gangrene was considered eminent. However, twenty-four hours after an arteriograf, the doctors were more optimistic since the blood supply appeared to be better and the tissue regained color and appeared to be responding. The wound site was covered with _____ dressings.

On the 14th day of July(6 days after the accident, 4 days after arteriograf) a first "clean-up" operation was performed. The pinless fixator was removed and an unreamed tibianail is brought in place. Since there was a lot of bone, which was not covered with tissue, some doctors feared gangrene and again were considering amputation. The attending nurses suggested that to overcome this problem, one should cover the bone with large pieces of Elasto-Gel(30 x 30cm), because past experiences showed bacterial growth inhibition under this dressing when it was applied to many previously treated large wounds. The doctors agreed and the leg was completely covered with Elasto-Gel occlusive wound dressings. In addition, to prevent the possible gangrene the use of hyperbaric oxygen was a part of the treatment. It was administered 3 times a day for 30 minutes. Hyperbaric oxygen treatment was used for over three months with this patient. Additionally, a systemic antibiotic I.V. treatment was administered for _____ days.

The wound dressings were changed every 24 hours. The odor was reduced dramatically after 18 hours after Elasto-Gel dressings were started and the odor was completely eliminated after 2 days. The appearance of the wound greatly improved.

On the 18th of July a second clean-up operation in preparation of the flap surgery was performed. Again an Elasto-gel dressing was used to dress the whole wound(pic. 3). During this period regular cultures were taken from the wound site to monitor the microburden. No infection was seen during the Elasto-gel treatment and no additional measures were required to control the bacterial contamination.

On the 25th of July two myocutaneous flaps were used to cover the bone areas. The first 7 days after the operation Surfsoft(Mediprof) dressing was used to cover the flaps.

Three(3) days after applying Surfasoft(or after the surgery) a small acceptable necrosis of the flap was present. Culturing the wound indicated an increase in the bioburden load in the wound site. Thereafter, Elasto-gel was used to help keep the wound moist and prevent infection(pic. 4). The operation was a success, but some exposed bone remained.

On the 8th of August another flap operation was completed. Elasto-gel was used as a primary dressing. Only a small part of the bone remained to be covered.

On the 5 of September another correctional operation was performed and the exposed tissue was completely covered with split thickness skin grafts.

The donor sites were covered with Surfasoft and the skin grafts were dressed with Elasto-Gel. After three days the donor sites became infected with *Pseudomonas aeruginosa*, but the graft sites were completely free of infection. The donor sites were then covered with Elasto-Gel and 5 days after the Elasto-Gel therapy was started the *Pseudomonas aeruginosa* was gone(pic. 5). After 21 days of treatment with Elasto-gel a thick jelly clot covering the skin graft wound was present(pic. 6) After removal of this fibrin-Glycerine substance, the jelly clot, an almost complete take of the skin grafts were noted(pic. 7).

On October 6th there was only a small area of bone that still needed to be covered(pic. 7?).

On the 28th of November a cross-over flap from the other leg was performed(pic. 8), which required that the muscle be attached to both legs simultaneously. A cast of plaster of Paris was made to keep the legs together. An external pin fixation was not possible because of the presence of the tibianail. The first week Surfasoft dressings were used on the open wounds. Again *Pseudomonas a.* infection developed. After this time Elasto-gel was used to cover all the wounds(pic. 9). It was quite difficult for the nurses to dress the wound since there was not much space left and the patient was not able to turn in his bed. Elasto-Gel was used for two main reasons: It was the only dressing which could easily be shaped to the contours of the wound and because of the difficulty to clean the wound(weakening of the plaster) we needed a dressing which could battle the present *Pseudomonas* infection.

On the 5th of December a correctional operation was needed to secure the flap.

Three months later on the 6th of February, 1996 the flap was split and the patient had both legs free again. The operation was a success. The flap on the left leg was healthy and the blood flow was excellent. (pic. 10).

The wounds were again treated the first week with Surfasoft and

Pic. 1
MOTORCYCLE MAN
July 8, 1995

Just after the accident
and minor cleanup.

Pic. 2
MOTORCYCLE MAN
July 8, 1995

Initial clean-up operation,
setting and stabilizing the
bones in left leg. Right
leg was also in temporary
cast.

Pic. 3
MOTORCYCLE MAN
July 11, 1995

Three(3) days after the initial
clean-up operation and setting
the bones. Some of muscle
tissue is dying.

Pic 4
MOTORCYCLE MAN
July 14, 1995

First clean-up operation.
Shows the large area of
exposed bone. Begin EG
dressings. Odor dramatically
reduced in 18hr. Gone 2 days.

Pic 5
MOTORCYCLE MAN
July 18, 1995

Just after the 2nd "clean-up"
operation. 10 days after
the accident. Culture wound.
Clean no bacteria.

Pic 6
MOTORCYCLE MAN
August 2, 1995

Seven(7) days after flap surgery
and has been dressed with Surfsoft
(Braun, Germany).

Pic 7

MOTORCYCLE MAN

August 4, 1995

9 days after flap surgery. Have now switched to Elasto-Gel dressings to help combat infection by Pseudomonas A. Doctors very concerned about gangrene and potential amputation.

August 8, 1995

Flap operation to close wound. EG used as dressing.

Pic 7'

MOTORCYCLE MAN

September 26, 1995

This shows the jelly clot formation under Elasto-Gel. The yellow and clear film over most of the graft. Next photo shows the good condition of the graft after removal of the jelly clot.

Pic 8

MOTORCYCLE MAN

September 26, 1995

Result after skin graft placement August 25 Switched dressing to Elasto-gel and changed dressing once/day, now 25 days. After removal of jelly clot that formed over graft, grafts were all OK.

Pic 9

MOTORCYCLE MAN

October 6, 1995

Almost fully closed. Small section of bone remains to be covered. Doctors don't think it will granulate over bone, so a cross leg flap should be performed.

Pic 10

MOTORCYCLE MAN
September 12, 1995

Donor site initially covered with SurfaSoft (Sept 5). After 3 days became infected with Pseudomonas a. Then covered with Elasto-gel. All infection gone after 5 days.

MOTORCYCLE MAN
November 28, 1995

Cross-over muscle flap was performed to the other leg. Then the wounds were covered with E.G. dressings and the two legs were put into a plaster cast.

MOTORCYCLE MAN
December 5, 1995

A correctional operation to secure the flap was performed.

MOTORCYCLE MAN
February 6, 1996

Split the flap graft and separated the legs. Begin rehabilitation. Cover wounds with Surfasoft for 7 days, then with E.G.

MOTORCYCLE MAN
Approx. March 5, 1996

Motorcycle Man walks out of the hospital with 2 legs.