

## **Case Number 4**

### **Motor Vehicle Accident**

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*Reviewed by: Mr Jason Zammit*

#### **Case summary:**

##### *Demographic details:*

Ms. SD, female.

Ms. SD is a 38-year-old female from Sliema who presented to Accident and Emergency after being involved in a motor vehicle accident. She was the pillion-rider on a motorcycle when the accident occurred and she suffered extensive wounds particularly to her left lower limb. No pulses were felt in her left leg when the ambulance arrived and a circa 10 cm segment of her tibia was lying external to her body on the road. She underwent four surgeries in less than two weeks to repair her blood supply, fix her tibia and pelvis and to close the wound using a skin graft. Another surgery was also carried out a month later to remove some areas of infection in the left tibia and to have a ring fixator applied.

#### **Presenting complaint:**

Motor vehicle accident.

#### **History of presenting complaint:**

The patient was involved in a motor vehicle accident on Monday 20th October 2014. She was the pillion-rider on a motorcycle when the vehicle was involved in a head on collision with a taxi, which was driving in the opposite direction (on the other side of the road). Consequently, she was thrown off the vehicle and ended up lying on the ground in immense pain.

#### **Past medical and surgical history:**

##### *Past medical history:*

Right ankle fracture in 2010 which required no surgery.

##### *Past surgical history:*

Wisdom tooth extraction.

#### **Drug history:**

No drug history and no known drug allergies.

#### **Family history:**

No significant family history

## **Social history:**

She lives in a flat in Sliema on her own where she has stairs. She had no walking problems prior to the accident. She works with an online gaming company.

She used to smoke socially but stopped a few years ago and she drinks 1 to 2 units of alcohol daily.

## **Systemic inquiry:**

- General Health: Has suffered from migraines since childhood .
- Cardiovascular System: Nil to note.
- Respiratory System: Nil to note.
- Gastrointestinal System: Nil to note.
- Genitourinary System: Nil to note.
- Central Nervous System: Nil to note.
- Musculoskeletal System: Nil to note.
- Endocrine System: Nil to note.
- Others: Nil to note.

## **Discussion of results of general and specific examinations:**

Upon arrival of the ambulance, she was found lying on her right side in a semiconscious state. Her eyes were open and she was occasionally responsive. Her left lower limb showed extensive damage with both soft tissue loss and bone exposure. A piece of her left tibia was found lying on the road outside of her leg. On examination on site, there was no pulse present in her left foot (dorsalis pedis and posterior tibial pulses) and a weak radial pulse was noted, possibly due to shock. Pulses in the right foot were palpable. Blood loss on site was estimated to be around 500mL.

## **Diagnostic procedures:**

The following blood tests were done: Urgent crossmatch, CBC, Urea & Electrolytes & Creatinine, RBG, V/ABGs, APTT/INR.

Doppler ultrasound was used to check the dorsalis pedis and posterior tibial pulses. These were both found to be pulseless in the left lower limb.

An urgent polytrauma CT was carried out.

X-rays were taken throughout management of the injuries, to monitor progress and to guide the surgeries.

## **Therapy:**

She was given ketamine immediately for pain relief and sedation which allowed the left lower limb to be reduced on site with external fixation applied subsequently.

On arrival at the hospital, the wound on her left lower limb was cleaned with saline and dressed. She was given a blood transfusion as well as the following medications:

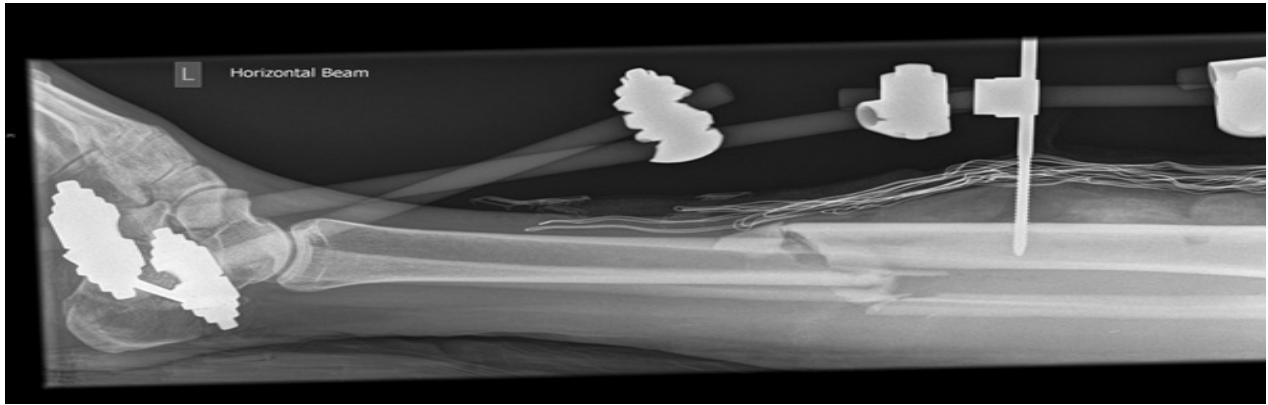
Drug	Route administered	Use
On arrival: 1. Ketamine 2. Saline 3. Cyklokapron (Tranexamic acid)	All were administered IV	1. An anaesthetic agent to reduce pain 2. To replace fluid loss 3. An antifibrinolytic to reduce bleeding
Ciprofloxacin	IV	An antibiotic – used prophylactically especially since the patient suffered a severe open wound.
Clindamycin	IV	Same reason as above.
Clotiapine	IV	An antipsychotic: used to reduce confusion and delusions.
Succinylcholine	IV	Used during orthopaedic operations as a muscle relaxant.

*Surgery 1: 20th October 2014*

On the 20th October (from ca. 11.30 pm till around 6.30 am the next day) she was taken for emergency surgery where she was initially operated on by the vascular surgeons in an attempt to restore the blood supply to her left lower leg. This was done by taking a venous graft (the lesser saphenous vein) and using it to create a femoro-popliteal bypass. Heparin IV 3000U was given to reduce the risk of developing deep vein thrombosis after the surgery.



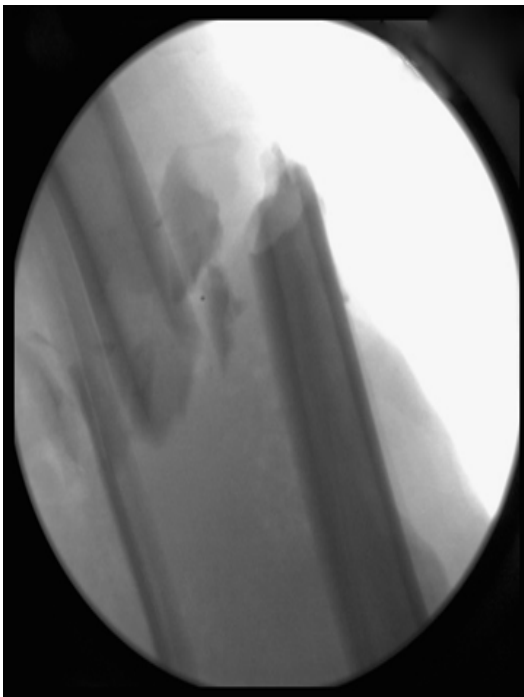
*Figure 1: An X-ray showing the acetabular fracture after initial fixing with an external fixator on 21st October*



*Figure 2: An X-ray taken on 21st October showing the external fixation done during the first surgery.*

Once both the dorsalis pedis and tibialis posterior pulses were restored, the orthopaedic surgeons operated on her left lower limb: the tibia that had been found outside of her leg was fixed back in place after thorough cleaning, the fragments of the lateral condyle of the tibia were held in place with a wire and finally the entire left lower limb was fixed using external fixator rods – from her left ankle all the way up to her pelvis.

Following this procedure, she was taken to the Intensive Care Unit for post-operative monitoring. She was then transferred to the orthopaedic ward to await her next surgery. During this time she asked for HIV and Hepatitis B and C blood tests to be carried out.



*Figure 3: A theatre fluoroscopy of the severely damaged tibia during the first emergency surgery on 21st October.*



*Figure 4: A theatre fluoroscopy of the left knee after wiring and fixation after the surgery on 25th October.*

*Surgery 2: 25th October 2014*

During this surgery, the external fixator rods on her leg were replaced with external fixator rings. Her pelvis was fixed in two stages due to it having been broken both posteriorly and anteriorly. During this particular surgery, the pelvis was openly reduced and internally fixed anteriorly using screws.

Finally a partial flap from her left gastrocnemius was placed over the massive wound on her left leg to keep the leg bones beneath vascularised and covered until the plastic surgeons could operate and place a complete flap over the wound in a subsequent surgery.



*Figure 5: A theatre fluoroscopy of the acetabular fracture prior to internal fixation on 25th October.*



*Figure 6: An X-ray taken on 29th October all major surgeries on the pelvis, showing the final internal fixation of the acetabulum.*

#### *Surgery 3: 28th October 2014*

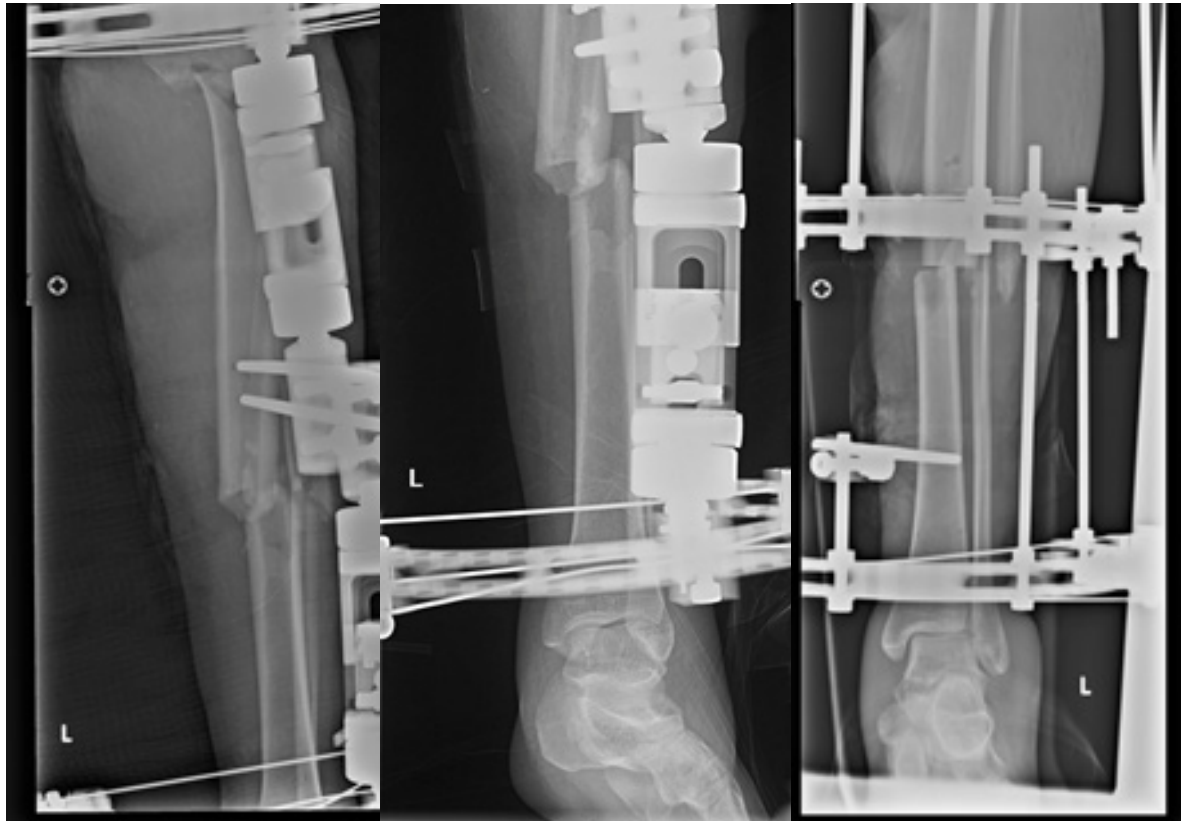
This was the second operation on her pelvis and consisted of an open reduction and internal fixation of the left acetabulum from a posterior approach, as well as a superficial skin grafting of the tibial wound.

#### *Surgery 4: 1st November 2014*

This time plastic surgeons were involved in making a fascio-cutaneous flap based laterally on her left lower limb, covering the gastrocnemius.

#### *Surgery 5: 2nd December 2014*

This was her final surgery where she had segmental excision of 3cm of infected left tibial fracture, adjustment of a ring fixator and local rotation skin flap for closure.



Figures 7, 8 and 9: Three X-rays which are arranged chronologically from left to right. The first was taken on 13th November, the next on 29th November and the final one on 4th December after her final surgery on 4th December 2014. These show the progress of the tibia from the initial damage, as the alignment improves slowly till a few days before discharge.

The following are the drugs she was given during her stay in hospital:

**Surgery 1**

Date	Drug	Route	Dose	Frequency	Reason
21/10/14	Morphine	IV	1mg	PRN	Opioid pain medication used to treat moderate to severe pain. Patient controlled anaesthesia.
	Protifar	PO	2 scoops	TDS	A special food for medical use to correct hypoproteinaemia.
	Paracetamol	PO/IV	1g	QDS	An analgesic.
	Metronidazole	IV	500mg	TDS	An antibiotic for anaerobe cover.
	Clindamycin	IV	600mg	TDS	An antibiotic-prophylactic use.
	Ciprofloxacin	IV	400mg	BD	An antibiotic-prophylactic use.
22/10/14	Clexane-low molecular weight heparin	SC	40mg	Daily	An anticoagulant therapy to prevent formation of blood clots post-operatively.
23/10/14	Co-amoxiclav	IV	1.2g	TDS	A penicillin antibiotic.

### Surgery 2 and 3

Date	Drug	Route	Dose	Frequency	Reason
28/10/14	Gentamicin	IV	320mg	Daily	An antibiotic-used to treat severe bacterial infections.
	Flucloxacillin	IV	2g	QDS	A penicillin antibiotic.
29/10/14	Clexane- low molecular weight heparin	SC	40mg	Daily	An anticoagulant therapy to prevent formation of blood clots post-operatively.
	Diclofenac	PO	50mg	TDS	A non-steroidal anti-inflammatory drug.

### Surgery 4

Date	Drug	Route	Dose	Frequency	Reason
1/11/2014	Lactulose	PO	10g	Daily	Medication to treat constipation.
	Protifar	PO	1 sachet	TDS	A special food for medical use to correct hypoproteinaemia.
14/11/2014	Codeine	PO	30mg	TDS	An opioid pain reliever used to treat mild and moderately severe pain.
17/11/2014	Ibuprofen	PO	400mg	TDS	A non-steroidal anti-inflammatory drug.

### Surgery 5

Date	Drug	Route	Dose	Frequency	Reason
4/12/2014	Prochlorperazine	IM	12.5mg	Daily	An anti-emetic used to prevent and treat nausea and vomiting.
6/12/2014	Prochlorperazine	PO	5mg	Daily/PRN	An anti-emetic used to prevent and treat nausea and vomiting.
7/12/2014	Hydroxyzine	PO	25mg	Nocte/PRN	A sedative used to treat anxiety and tension, as well as an antihistamine.

All throughout her stay in hospital, she was being seen by a physiotherapist and monitored by the orthopaedic staff.

## **Final treatment and follow up:**

Discharged on 15th November 2014.

Plan on discharge:

-Change dressings every 3 days.

-Orthopaedics outpatient visit on 7th January 2015 – X-ray of the pelvis and left leg should be taken on the day.

-Another orthopaedics outpatient visit on 15th January 2015.



## **Fact Box 4:**

*Title:* Motor Vehicle Accident

Motor vehicle accidents are commonplace in Malta. During the year of 2013 a total of 14,070 accidents were reported, according to the National Statistics Office of Malta. Of these, only 18 were fatal and 14 of these fatalities were males. It also emerged that no passengers were among these 18 fatalities, but 2 pedestrians were.

At the moment, the European Commission for Mobility and Transport is collecting data from all countries of the EU and studying the trends of traffic accidents and fatalities in a massive Road Safety Programme. The aim of this programme is to reduce the number of fatalities due to traffic accidents by improving a number of factors, including road safety and drivers' behaviour. The total number of deaths in the EU (28 countries) due to traffic accidents in 2012 was 28,100 – 11 of them were in Malta.

For its small size, Malta may only have a small amount of fatalities, but the differences in infrastructure of the country have to be taken into consideration too: while abroad many countries have large motorways and rather high average speeds, Malta has very short, narrow roads which should make drivers drive at much slower average velocities. Hence one might still want to find out why 18 people in 2013 and 11 in 2012 died in Malta due to road traffic accidents when cars are meant to be travelling so slowly: is it poor road safety, or the road users' negligent behaviour?

### **References:**

1. [http://nso.gov.mt/en/News\\_Releases/View\\_Current\\_Year/Pages/2014-\(1\).asp](http://nso.gov.mt/en/News_Releases/View_Current_Year/Pages/2014-(1).asp)
2. [http://ec.europa.eu/transport/road\\_safety/specialist/statistics/index\\_en.htm](http://ec.europa.eu/transport/road_safety/specialist/statistics/index_en.htm)
3. [http://ec.europa.eu/transport/road\\_safety/pdf/observatory/trends\\_figures.pdf](http://ec.europa.eu/transport/road_safety/pdf/observatory/trends_figures.pdf)