Inf – ER Combined Meeting

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2012/02/18

Case1 Patient Data

- 50 y/o, male
- Date: 2012/xx/07, 08:41
- E4V5M6
- TPR: 36.9 /100/16 BP:169/86 mmHg
- SpO2: 98%
- 檢傷主訴：左腳局部紅腫
- Triage: 3

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History

- Chief Complaint: left thight pain for 3 days
- Left thigh pain(+) ,erythema(+)
- No fever
- Bil leg :chronic ulcer

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Past History

- Allergy: NKA
- DM
- Liver cirrhosis

Physical Examination

- Cons: clear
- Neck: supple
- Chest: Bil clear
  - RHB, no murmur
- Abdomen: soft,
  - No tender
  - No rebound tender
  - No muscle guarding
- Left thigh: erythema,swelling and local heat
- Bil leg:ulcer,ecchymosis,ruptured vesicle

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Impression:

- Left thigh cellulitis r/o necrotizing fasciitis

Initial management

day1 09:03

- CBC/DC/PLT
- Panel 1 CRP
- PT/aPTT
- B/C x II
- N/S run 60 cc/hr
- Morphine 5 mg
- Pus culture
- Wound CD wet dressing
- Take photo

Lab

Glucose	122	mg/dL	70.000	110.000	*H
GOT(AST)	44	U/L	5.000	35.000	*H
BUN	25	mg/dL	8.000	20.000	*H
Creatinine	0.8	mg/dL	0.500	1.300	
Na	137	meq/L	133.000	145.000	
K	3.9	meq/L	3.300	5.100	
eGFR	102.75				
CRP	10.600	mg/dL	0.000	0.500	*H

Lab

PT	20.4	second	9.400	12.500	*H
Normal control	10.6	second			
INR	1.86	Ratio	0.800	1.200	*H
APTT	33.0	second	28.600	38.600	
Normal control	32.8	second			

Lab

WBC	10.4	X1000/ul	3.800	10.000	*H
RBC	3.39	million	4.500	5.700	*L
Hb	11.9	gm/dl	13.000	18.000	*L
Ht	35.2	%	40.000	54.000	*L
MCV	103.8	fl	81.000	98.000	*H
MCH	35.1	pg	27.000	32.000	*H
MCHC	33.8	%	32.000	36.000	
RDW	18.5	%	11.500	14.500	*H
Platelet	11	x1000/ul	140.000	450.000	LL
Differential count	**********				
Segmented Neutro.	81.0	%	37.000	75.000	*H
Lymphocyte	8.0	%	20.000	55.000	*L
Monocyte	4.0	%	4.000	10.000	
Band	7.0	%	0.000	5.000	*H

Further manegement

- Day1 10:30
- L't leg CT with/without constrast
- 備PLT 24U
- Penicillin G 3x 10^6 U iv st
- Clindamycin 600 mg iv st
- Cefotaxime 2g iv st

CT

CT report

- Swellling/edema of the bilateral legs more on L. With subcutis infiltraton, skin induration and fluid collection under the superficial fascia shown but no definite abscess detected in the study; celklulitis compatible; no defenite intrammuscular lesons noted and suggest MRI study for further evaluation.

PS consultation

- Severe cellulitis ,may progress to necrotizing fasciitis

Inf consultation

- Severe necrotizing cellulitis
- Oxacillin 2g q4h
- Cefotaxime 2g q8h

Admission course

- admission (Inf VS service)
  - Oxacillin 2g q4h
  - Claforan2g q8h
  - BT PLT 24U
  - Lactulose

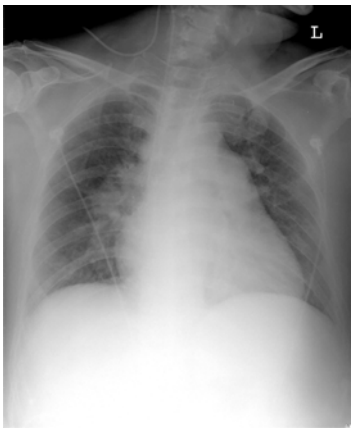
Shock noted on day1 22:00

- BP 96/57 mmHg HR 120/min BT 38 RR 20
  - BP 72/42 mmHg
- On cvp
- Fluid challenge
- Levophed
- f/u lab

Lab

Lactate	63.4	mg/dL	4.500	19.800	*H
Ammonia	80	ug/dL	19.000	94.000	
BUN	36	mg/dL	8.000	20.000	*H
Creatinine	1.6	mg/dL	0.500	1.300	*H
eGFR	46.17				
Na	139	meq/L	133.000	145.000	
K	3.5	meq/L	3.300	5.100	
Cl	102	meq/L	96.000	108.000	
	4.38	mg/dL	3.680	5.600	
P	3.50	mg/dL	2.500	4.500	

CXR



Day 2

albumin	2.0	g/dL	3.400	4.800	*L
GPT(ALT)	54	U/L	10.000	50.000	*H
T-Bilirubin	15.1	mg/dL	0.200	1.300	*H
D-Bilirubin	11.0	mg/dL	0.000	0.400	*H
HbA	4.10	%	4.000	6.000	

Day 2

WBC	20.2	x1000/ul	3.800	10.000	*H	10.4
Segmented Neutro.	80.5	%	37.000	75.000	*H	81.0
Lymphocyte	5.0	%	20.000	55.000	*L	8.0
Monocyte	5.0	%	4.000	10.000		4.0
Band	9.5	%	0.000	5.000	*H	7.0
Platelet	33	x1000/ul	140.000	450.000	*L	11

Day2

PT	21.9	second	9.400	12.500	*H	20.4
Normal control	10.6	second				32.8
INR	1.99	Ratio	0.800	1.200	*H	1.86

Day 2

- BP 比較穩定
- Lethargy →hepatic encephalopathy
- Diuretics
- Albumin 1BT qd x3 days

Consult PS again

- Keep current ABX
- 如果PLT < 100000 則不會考慮OP

Day 3

Creatinine	0.5	mg/dL	0.500	1.300		1.6
eGFR	176.73					46.17
Na	141	meq/L	133.000	145.000		139
K	3.2	meq/L	3.300	5.100	*L	3.5

Day 3

Hb	10.3	gm/dl	13.000	18.000	*L	11.9
WBC	10.3	x1000/ul	3.800	10.000	*H	20.2
Differential count	*********					*********
Segmented Neutro.	83.5	%	37.000	75.000	*H	80.5
Lymphocyte	9.0	%	20.000	55.000	*L	5.0
Monocyte	6.0	%	4.000	10.000		5.0
Eosinophil	0.5	%	0.000	5.000		0.0
Basophil	0.0	%	0.000	2.000		0.0
Atypical lymphocyte	0.0	%	0.000	3.000		0.0
Band	1.0	%	0.000	5.000		9.5
Platelet	43	x1000/ul	140.000	450.000	*L	33

Day 3

- DC oxacillin :bacteremia G(-)
- Keep Cefotaxime 2g q8h
- BT PLT 24U

Day 4 FINAL B/C REPORT

- Organism:
- Escherichia coli
- Antibiotic/Culture:E21 Escherichia coli
- AM AN CAZ CIP CMZ CRO CZ ETP FEP GM LVX
- R S S S S S R I/S S S S
- >=32 <=2 <=1 <=.25 <=1 <=1 16 <=.5 <=1 <=1 <=.12
- MEN PIP SAM SXT TGC
- S R R R S
- <=.25 >=128 >=32 >=320 <=.5
- AM:Am(Ampicillin) AN:AN(Amikin) CAZ:CAZ(Ceftazidime)
- CIP:CIP(Ciprofloxacin) CMZ:CMZ(Cefmetazole) CRO:CRO(Ceftriaxone)
- CZ:CZ(Cefazolin) ETP:ETP(Ertapenem) FEP:FEP(Cefepime)
- GM:GM(Gentamicin) LVX:LVX(Levofloxacin)
- MEN:MEM/IPM(Meropenem/Imipenem) PIP:PIP(Piperacillin)
- SAM:SAM(Ampicillim&Sulbactum) SXT:SXT(Bactrim) TGC:TGC(Tigecycline)

Day 4

- DC Cefotaxime
- Fortum 2g Q8H

Day 5 PUS/WOUND AEROBIC CULTURE

- 1.Pseudomonas aeruginosa --- Moderate
- /////
- Antibiotic/Culture:K58 Pseudomonas aeruginosa
- AN CAZ CIP FEP GM LVX MEN PIP TZP
- S S S S S S S S S
- <=2 4 <=.25 2 <=1 1 <=.25 8
- AN:AN(Amikin) CAZ:CAZ(Ceftazidime) CIP:CIP(Ciprofloxacin)
- FEP:FEP(Cefepime) GM:GM(Gentamicin) LVX:LVX(Levofloxacin)
- MEN:MEM/IPM(Meropenem/Imipenem) PIP:PIP(Piperacillin)
- TZP:TZP(Tazocin)

Day 6

Creatinine	0.7	mg/dL	0.500	1.300		0.5
eGFR	119.86					176.73
Na	134	meq/L	133.000	145.000		141
K	4.2	meq/L	3.300	5.100		3.2
CRP	7.110	mg/dL	0.000	0.500	*H	10.600

Hb	10.7	gm/dl	13.000	18.000	*L	10.3
WBC	8.5	x1000/ul	3.800	10.000		10.3
Differential count	*********					*********
Segmented Neutro.	69.5	%	37.000	75.000		83.5
Lymphocyte	10.5	%	20.000	55.000	*L	9.0
Monocyte	7.0	%	4.000	10.000		6.0
Eosinophil	0.0	%	0.000	5.000		0.5
Basophil	0.0	%	0.000	2.000		0.0
Atypical lymphocyte	1.0	%	0.000	3.000		0.0
Band	5.5	%	0.000	5.000	*H	1.0
Metamyelocyte	6.0	%	0.000	0.000	*H	0.0
Myelocyte	0.5	%	0.000	0.000	*H	0.0
Platelet	45	x1000/ul	140.000	450.000	*L	43

Case 2 Patient Data 1st visit

- 43 y/o, male
- Date: 2012/01/xx, 09:18
- E4V5M6
- TPR: 35.6/96/15 BP:164/103 mmHg
- SpO2: 100%
- 檢傷主訴：右膝關節腫脹/疼痛
- Triage: 4

History

- Chief Complaint: right knee pain for one week
- Right pain and swelling
- No trauma history
- Gout(+) history ,之前都是右膝swelling
- 喝酒後開始痛
- No fever

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Past History

- Allergy: NKA
- Gout

Physical Examination

- Cons: clear
- Neck: supple
- Chest: Bil clear
  - RHB, no murmur
- Abdomen: soft,
  - No tender
- Right knee:Local heat,tenderness and swelling , No erythema,No calf involvement

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Impression:

- Right knee Gout

Manegement

- Keto 1 amp IM
- Cataflam 1# po tid x 3days
- Colchicine 1# po tid x 3days
- MBD&衛教if pain 个 回ER

2nd Visit day2 01:20

•43 y/o, male
•Date: 2012/01/xx, 01:20
•E4V5M6
•TPR: 36.6/111/18 BP:206/115 mmHg
•SpO2: 98%
•檢傷主訴：右下肢疼痛抽筋
•Triage: 3

History

- Chief Complaint: right leg pain,cramp

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Physical Examination

- Cons: clear
- Right Leg:cramping pain,soft,no tender

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Manegement

- Keto 1 amp
- Solaxin 1 # po st
- Recheck BP HR
- HB WBC/DC
- Panel 1/ CPK/ iCa
- N/S 60/hr

Lab

Hb	12.5	gm/dl	13.000	18.000	*L	13.6
WBC	19.3	x1000/ul	3.800	10.000	*H	8.4
Differential count	*********					
Segmented Neutro.	79.8	%	37.000	75.000	*H	
Lymphocyte	12.2	%	20.000	55.000	*L	32.2
Monocyte	7.4	%	4.000	10.000		4.6
Eosinophil	0.5	%	0.000	5.000		0.4
Basophil	0.1	%	0.000	2.000		0.6

Lab

Glucose	150	mg/dL	70.000	110.000	*H
GOT(AST)	24	U/L	5.000	35.000	
BUN	18	mg/dL	8.000	20.000	
Creatinine	0.9	mg/dL	0.500	1.300	
Na	140	meq/L	133.000	145.000	
K	3.9	meq/L	3.300	5.100	
eGFR	92.10				
CPK	43	U/L	39.000	308.000	
	4.79	mg/dL	3.680	5.600	

Further manegement

- Leg x ray ,R
- Morphine 5 mg iv st
- 補CRP

Lab

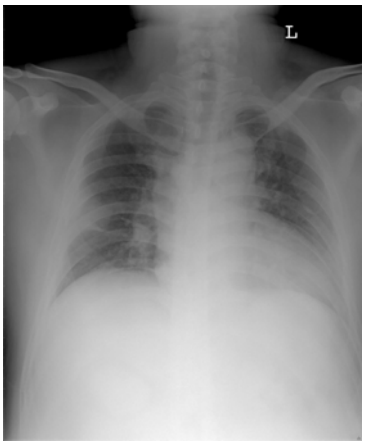
CRP	34.600	mg/dL	0.000	0.500	*H

Bedside echo

- No intra-abdominal lesion
- No knee joint effusion

Leukocytosis + CRP

- CXR
- U/A
- Leg CT



CT

CT report

- 1. Consistent with gouty arthritis involving both knees,both ankles, right MTP joint and 1st IP joint of left foot.
- 2. Marked bursitis of right knee with myositis and inter/intramuscular edema over the posterior muscle groups, suggest joint effusion aspiration to exclude coexistent infection.

Further management

- PLT
- PT/aPTT
- T Bil
- B/C 2
- Penicillin G 3MU v st
- Fortum 2 g v st
- Clindamycin 600 mg v st
- Consult PS

Lab

T-Bilirubin	0.6	mg/dL	0.200	1.300	
PT	15.9	second	9.400	12.500	*H
Normal control	10.6	second			
INR	1.47	Ratio	0.800	1.200	*H
APTT	31.7	second	28.600	38.600	
Normal control	32.8	second			
Platelet	366	x1000/ul	140.000	450.000	

PS consultation

- Susp Necrotizing fasciitis
- Suggest OP

Inf consultation

- Aq PCN 3MU Q4H
- Fortum 2g Q8H
- Clindamycin 900mg Q8H

Day 5

- Debridement

Pus culture day5

- PUS/WOUND AEROBIC CULTURE:
  - Aerobic culture: No colony grow in 3 days cultured.
- PUS/WOUND ANEROBIC CULTURE:
  - Anaerobic culture:No colony grow in 5 days cultured.

Pathology

- DIAGNOSIS:
- Soft tissue, right lower leg, S/P Debridement,
- debridement and biopsy --- Necrotizing inflammation
- GROSS DESCRIPTION:
- The specimen submitted consists of 3 fragments of blood clots and
- soft tissue measuring up to 1.5 x 1.0 x 0.5 cm in size, in fresh
- state. They are black and soft.
- All for section is taken.
- MICROSCOPIC DESCRIPTION:
- Section shows blood clots and fragments of inflamed granulation ti-
- ssue and skeletal muscle with hemorrhages and necrosis.
- REFERENCE:
- S12-01583
- Skin and soft tissue, right lower leg, S/P Fasciotomy,
- debridement and biopsy --- Necrotizing inflammation
- S09-16881
- Soft tissue, right ankle region, excisional biopsy --- Tophi

Pathology

- GROSS DESCRIPTION:
- The specimen submitted consists of 11 pieces of skin and soft tissue
- measuring up to 2.0 x 1.3 x 0.3 cm in size, in fresh state. The skin
- is erythematous and ulcerated. On cuttings, the soft tissue is ne-
- crotic.
- Representative section is taken.
- MICROSCOPIC DESCRIPTION:
- Section shows eosinophilic amorphous necrotic tissue and pieces of
- inflamed granulation tissue.
- REFERENCE:
- S09-16881
- Soft tissue, right ankle region, excisional biopsy --- Tophi

Day 8

- Debridement

B/C 2 day8

- Aerobic: -
- Anerobic: -
- No microorganism grow in 7 days cultured.

Day 8

CRP	16.000	mg/dL	0.000	0.500	*H	34.600

Day 14

CRP	6.290	mg/dL	0.000	0.500	*H	16.000
PT	14.3	second	9.400	12.500	*H	
Normal control	10.6	second				
INR	1.33	Ratio	0.800	1.200	*H	
APTT	31.7	second	28.600	38.600		
Normal control	32.8	second				

Day 14

Hb	9.8	gm/dl	13.000	18.000	*L	10.4
WBC	10.3	x1000/ul	3.800	10.000	*H	10.9
Differential count	*********					*********
Segmented Neutro.	60.3	%	37.000	75.000		75.5
Lymphocyte	27.7	%	20.000	55.000		15.5
Monocyte	7.8	%	4.000	10.000		5.8
Eosinophil	4.0	%	0.000	5.000		2.9
Basophil	0.2	%	0.000	2.000		0.3

Discussion

Necrotizing Soft Tissue Infections

- Fulminant
- Extensive soft tissue necrosis
- Systemic toxicity
- High mortality

Term

- *Fournier gangrene*
- *Necrotizing fasciitis*
- *Necrotizing soft tissue infection*
- *Gas gangrene*

Surgical consultation

- In patients with bullae, crepitus, pain out of proportion to examination, or rapidly progressive erythema with signs of systemic toxicity, because these signs and symptoms suggest necrotizing infection.

Risk factors

- Advanced age
- Diabetes mellitus
- Alcoholism
- Peripheral vascular disease
- Heart disease
- Renal failure
- HIV, cancer
- NSAID use
- Decubitus ulcers
- Chronic skin infections
- IV drug abuse
- Imune system impairment

High mortality rate

- The mortality rate remains 25% to 35%
- Bacteremia is reported in 25% to 30% of cases and is a strong predictor of mortality.

Large cutaneous bullae

Microbiology

- Type I (polymicrobial) infections include 55% to 75% of all necrotizing soft tissue infections
- Type II (monomicrobial) infections are caused by Group A *Streptococcus*, either alone or with *S. aureus*

Pathophysiology

- direct invasion of subcutaneous tissue from external trauma
- Skin involvement is secondary to vasculitis and thrombosis of perforating blood vessels. The ischemic tissue environment promotes bacterial growth, propagating the process and resulting in rapid spread of the infection.
- **Infection can spread as fast as 1 in./h.**

Clinical Features

- tissue pain, anxiety, and diaphoresis
- **Pain is often out of proportion**
- Trauma or a break in the skin roughly 48 hours
- a low-grade fever with **tachycardia out of proportion to the fever**.

Diagnosis

- The diagnosis is clinical.
- Plain x-ray may reveal subcutaneous gas but will not show deep fascial gas and is therefore a poor screening tool.
- CT is more sensitive (80%) and can demonstrate fascial thickening and edema, deep tissue collections, and gas formation.
- IV contrast provides no additional benefit.

Treatment

- Early surgical consultation is indicated for all suspected cases of necrotizing fasciitis, and the gold standard for diagnosis and the fundamental therapy remains operative exploration and surgical debridement.