

ER & infection conference

A 50 y/o female,
Sereve left neck and chest pain for 3 weeks

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102.08.17

Visit ER at 09:14

- Chief complaint: left neck and chest pain for 3 weeks
- Triage: III
- T/P/R:36.2/79/20, BP=130/78, SpO2=99%
- Conscious: alert

Present illness

- Acupuncture(埋針 for whole night) 3 weeks ago, Left neck to shoulder pain since the next day
- Visited 馬偕, 長庚 ER for help→ no abnormal finding was told there→ analgesic usage (tinten, morphine)
- 2 days before admission: erythema and tender point over left upper chest region, in progression, no discharge
- Fever(-), dysphagia(-), dyspnea(-)

Past history

- Allergy: NSAID
- Medical history
 - Diabetes mellitus for 2 years
 - HBV related liver cirrhosis
- Surgical history
 - Appendectomy
- TOCC:
 - Travel history: denied, occupation: 大樓清潔人員, contact history: denied, cluster: denied

Physical examination

- Cons: alert
- Head & neck: left upper chest painful mass lesion
- Chest: clear breath sounds, regular heart beats
- abdomen: soft, normoactive bowel sounds, no tenderness or muscle guarding
- Extremity: limited active & passive ROM over left shoulder (pain?)
- neurologic signs: no focal signs



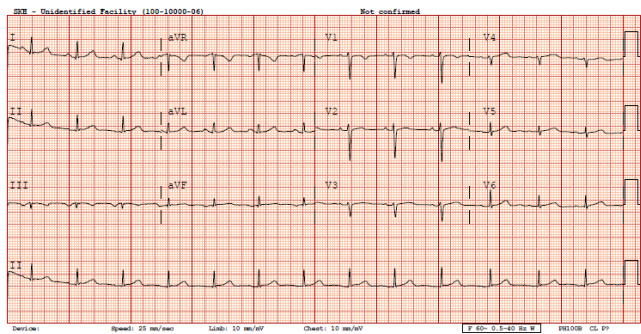
Impression

- Suspected cellulitis r/o deep neck infection, mediastinitis

Management(09:45)

- Hb, WBC/DC, Platelet
- AST, Cr, Na, K, CRP
- F/S(96)
- B/C X 2
- EKG
- Neck to chest CT scan
- Morphine 5 mg iv STAT
- N/S 80 ml/hr

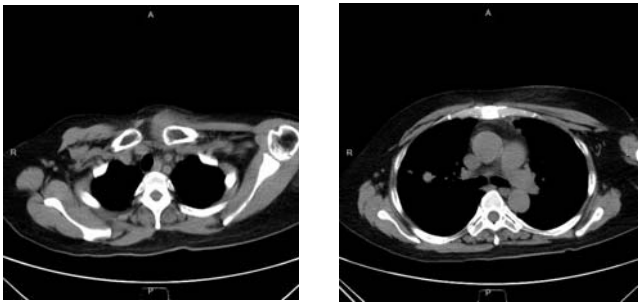
EKG



Laboratory data

Hb	11.7	gml/dl	GOT(AST)	19	U/L
WBC	9.4	x1000/uL	Creatinine	0.32	mg/dL
Differential count	*****		eGFR	218.58	
.Segmented Neutro.	85.6	%	Na	132	meq/L
.Lymphocyte	8.4	%	K	4.2	meq/L
.Monocyte	5.6	%	CRP	19.540	mg/dL
.Eosinophil	0.3	%			
.Basophil	0.1	%			
.Atypical lymphocyte		%			
.Band		%			
.Metamyelocyte		%			
.Myelocyte		%			
.Promyelocyte		%			
.Blast		%			
.Nucleated RBC		/100WBC			
Platelet	354	x1000/uL			

CT scan



Impression

- Upper mediastinal tumor with sternal involvement r/o abscess

Management

- Tapimicin 4.5g q8h iv (11:09)
- Check PT/PTT (12:30)
- Consult C/S doctor(12:30)
 - Chest wall infection
 - Antibiotic treatment
 - Echo-guided biopsy for microorganism survey

PT	14.0	second
.Normal control	10.2	second
INR	1.37	Ratio
APTT	30.6	second
.Normal control	33.3	second
.APTT ratio	0.92	

Management

- Consult infection doctor(14:09)
 - Impression: (1) Left sternoclavicular septic arthritis and osteomyelitis (2)Right lung nodules
 - antibiotic change
 - Check CEA, Cryptococcus antigen, ESR

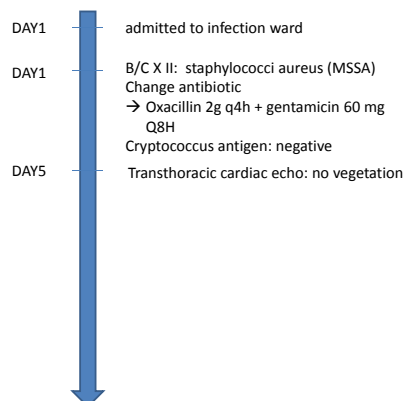
Impression

- Left sternoclavicular septic arthritis and osteomyelitis
- Right lung nodules

Management(15:46)

- Oxacillin 2g iv Q6H + Ceftriaxone 2g iv Q12H
- Check CEA, ESR, Cryptococcus antigen

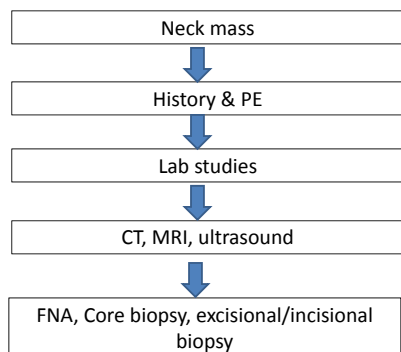
Hospitalization course



Discussion

- approach to evaluate a neck mass
- Septic arthritis
 - Infected route
 - microbiology
 - Treatment
- Paper--sternoclavicular septic arthritis—review of 180 cases

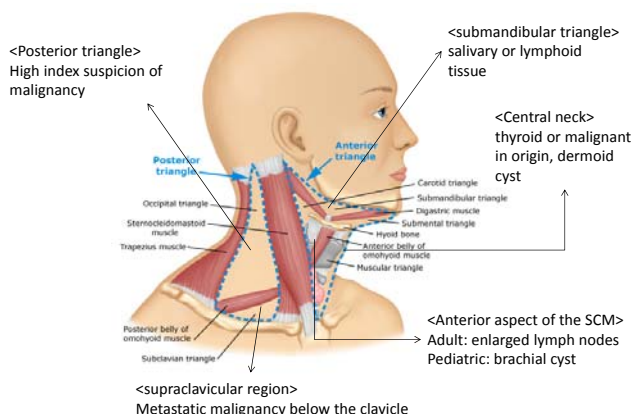
Approach



Patient history

- Age
 - Pediatric, <40 y/o: congenital or inflammatory origin
 - > 40 y/o: consider malignant until prove otherwise
- Mass growth pattern
 - Present with years with little change– benign neoplasm
 - Rapid expanding– infection or lymphoma
 - Fluctuate over time– often congenital
- Symptoms
 - High spiking fever→ acute infection
 - Night sweat, weight loss, fever→ lymphoma
 - Dysphagia, hoarseness, voice change→ cervical LN metastasis
- Alcohol, smoking, IV drug, HIV, TOCC..

Physical examination



Physical examination

- Palpation: location, size, shape, consistency, tenderness, mobility, and color
 - lymph node
 - Reactive: discrete, mobile, firm or rubbery, slightly tender
 - Metastatic: fixed, non-tender
 - Infected :isolated, asymmetric, tender, warm, and erythematous
 - Rock-hard, fixed masses: malignancy
 - rapidly expanding mass (days to weeks): infection, lymphoma
 - Pulsatile or bruit: vascular origin
 - Immobile midline mass with elevation with swallowing: thyroid origin
- oral cavity, cranial nerves, thyroid gland, general examination

Laboratory studies

- Initiate when
 - History or PE : Not transient reactive lymphadenopathy
 - newly discovered neck mass beyond three weeks
- Component– based on History and PE
 - ESR and/or CRP : systemic inflammation or infection
 - Blood culture : if febrile
 - EBV or CMV serology :diffuse adenopathy
 - HIV serology

Imaging studies

- Sonography
- Contrast CT: initial study of choice for most patients
- MRI: further definition of soft tissue (infiltrative soft tissue masses, suspicion of malignant perineural spread), indicated in following-up

Diagnostic studies

- Fine needle aspiration
 - preferred diagnostic approach for most neck masses
 - No definite
- Core biopsy
- Excisional or incisional biopsy

Septic arthritis

Source of infection

- Blood stream
 - 72% hematogenous spread
- contiguous site of infection in bone or soft tissue
- direct inoculation during surgery, injection, animal or human bite, or trauma

microbiology

common →

Trauma, immuno-compromised, neonate, iv drug, elderly →

Acute Monoarticular Arthritis	Chronic Monoarticular Arthritis	Polyarticular Arthritis
<i>Staphylococcus aureus</i>	<i>Mycobacterium tuberculosis</i>	<i>Neisseria meningitidis</i>
<i>Streptococcus pneumoniae</i>	Non-tuberculous mycobacteria	<i>N. gonorrhoeae</i>
β -Hemolytic streptococci	<i>Borrelia burgdorferi</i>	Nongonococcal bacterial arthritis
Gram-negative bacilli	<i>Treponema pallidum</i>	Bacterial endocarditis
<i>Neisseria gonorrhoeae</i>	<i>Candida</i> species	<i>Candida</i> species
<i>Candida</i> species	<i>Sporothrix schenckii</i>	Poncet's disease (tuberculous rheumatism)
Crystal-induced arthritis	<i>Coccidioides immitis</i>	Hepatitis B virus
Fracture	<i>Blastomyces dermatitidis</i>	Parvovirus B19
Hemarthrosis	<i>Aspergillus</i> species	HTV
Foreign body	<i>Cryptococcus neoformans</i>	Human T-lymphotropic virus type I
Osteoarthritis	<i>Neisseria</i> species	Rubella virus
Ischemic necrosis	<i>Brucella</i> species	Arthropod-borne viruses
Monoarticular rheumatoid arthritis	Legg-Calvé-Perthes disease	Sickle cell disease flare
	Osteoarthritis	Reactive arthritis
		Serum sickness
		Acute rheumatic fever
		Inflammatory bowel disease
		Systemic lupus erythematosus
		Rheumatoid arthritis/Still's disease
		Other vasculitides
		Sarcoidosis

Treatment

- Prompt administration of systemic antibiotics and drainage of the involved joint
- Empirical antibiotics
 - community-acquired adult infections
 - negative smear results: cefotaxime (1 g Q8 h) or ceftriaxone (1–2 g QD)
 - GPC on smear: oxacillin or nafcillin (2 g q 4 h)
 - MRSA was suspected(widespread in community or in hospital patient): IV vancomycin (1 g q12 h)
 - Iv drug user: third-generation cephalosporin +/- aminoglycoside
- Duration: 2-4 weeks
 - parenteral antibiotics ≥ 14 +oral therapy (if possible) for 14 days (uptodate/septic arthritis) Harrison 17th edition, chapter 328

Sternoclavicular Septic Arthritis

Review of 180 Cases

John J. Ross, MD, and Hala Shamsuddin, MD



Source: Fauci AS, Kasper DL, Braunwald E, Hauser SL, Longo DL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine*, 17th Edition. <http://www.accessmedicine.com>. Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

epidemiology

- Sternoclavicular septic arthritis: 1 % septic arthritis(8/738 in 6 large series study)

Clinical feature

Characteristic	No. of Patients (%)
→Male	123/168 (73)
Female	45/168 (27)
→Chest pain	122/156 (78)
Shoulder pain	38/156 (24)
Painless swelling SC joint	7/156 (4)
→Right SC joint involved	91/161 (57)
Left SC joint involved	62/161 (39)
Bilateral SC involvement	8/161 (5)
→Polyarticular septic arthritis	35/168 (21)
Tender SC joint	132/147 (90)
Decreased ROM shoulder	25/147 (17)
→Fever > 38 °C	94/144 (65)
→WBC > 11 × 10 ⁹	39/70 (56)
→Bacteremia	61/99 (62)
Surgery performed	102/174 (59)
Clavicular and/or sternal osteomyelitis	94/168 (56)
Chest wall abscess	42/168 (25)
Mediastinitis	21/168 (13)
Mortality	7/173 (4)

- Mean age: 45 y/0 (48 y/o if excluding the iv drug user (33/170))
- Median duration of symptoms presentation: 14 days, may attribute from no prominent effusion
- Lesion culture positive:77%
- Serious complication: chest wall abscess(25%), mediastinitis(13%)

Medicine , volume 83, number 3, May 2004

Radiological finding

- Plain film: 85%(87/102) was normal
- CT scan: abnormalities (95/95)
- MRI: abnormalities (10/10)

Predisposing condition

TABLE 3. Predisposing Conditions in 168 Cases of Sternoclavicular Septic Arthritis

Predisposing Condition	No. of Patients (%)
None/healthy	38 (23)
Intravenous drug use	36 (21)
Infection at a distant site	25 (15)
Diabetes mellitus	22 (13)
Trauma	20 (12)
Infected central line	15 (9)
Chronic renal failure	13 (8)
Alcoholism	10 (6)
Corticosteroids	7 (4)
HIV infection	7 (4)
Malignancy	7 (4)
Cirrhosis	6 (4)
Miscellaneous*	29 (17)

*Miscellaneous risk factors included chronic obstructive pulmonary disease (5), cardiac disease (4), vasculitis (3), animal bite or scratch (3), gout (2), rheumatoid arthritis (2), radiation therapy (2), bone marrow transplantation (2), infected arteriovenous fistula (2), postpartum (2), splenectomy (1), anabolic steroids (1).

Medicine , volume 83, number 3, May 2004

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bacteriology

Organism	No. of Isolates (%)
<i>Staphylococcus aureus</i>	86 (49)
<i>Pseudomonas aeruginosa</i>	18 (10)
<i>Brucella melitensis</i>	13 (7)
<i>Escherichia coli</i>	8 (5)
Group B streptococcus	6 (3)
<i>Mycobacterium tuberculosis</i>	6 (3)
Polymicrobial	6 (3)
Streptococcus NOS*	5 (3)
<i>Streptococcus pneumoniae</i>	4 (2)
Anaerobes	2 (1)
Group A streptococcus	2 (1)
<i>Haemophilus influenzae</i> type b	2 (1)
Group G streptococcus	2 (1)
<i>Streptococcus milleri</i> group	2 (1)
<i>Neisseria gonorrhoeae</i>	2 (1)
Other enteric Gram-negative rods ¹	5 (3)
Miscellaneous ²	7 (4)

*NOS, not otherwise specified.

¹One each of *Acinetobacter anitrans*, *Burkholderia pseudomallei*, *Citrobacter diversus*, *Proteus mirabilis*, and *Serratia marcescens*.

²One each of *Candida albicans*, *Haemophilus aphrophilus*, *Mycobacterium avium* complex, *Pasteurella multocida*, *Propionibacterium acnes*, *Staphylococcus epidermidis*, and *Streptobacillus moniliformis*.

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Treatment and outcome

- Surgery :58%(102/174)
 - Limited debridement (48): Extensive debridement (54): en-bloc resection of SC joint, removing up to one-half the manubrium and medial third of clavicle
 - 13 patients received enbloc resection due to previous failed debridement
 - 11 patients treated medical failed
- Antibiotic course (exclusion of tuberculosis)
 - without surgery: 41 days
 - with surgery: 52 days

Management suggestion

- CT scan or MRI should be obtain routinely
- Surgery: extensive bony destruction, chest wall phlegmon or abscess, retrosternal abscess, mediastinitis, or pleural extension
- Medical treatment if limited disease
 - Simple Incision and drainage
 - Needle aspiration was difficult for paucity of joint fluid

Empirical antibiotic

- Oxacillin or cefazolin : cover *S. aureus*
- Vancomycin: iv drug use, central venous access, recent hospitalization, High prevalence region of MRSA
- Cefepime or piperacillin-tazobactam: immunocompromised, infected subclavian line
- Course: 4 weeks in uncomplicated arthritis, 6 weeks in patient complicated with osteomyelitis or mediastinitis

IV drug user

- 17% of SC septic arthritis (42/251)
- popular injection site: 99% antecubital fossa, 71% forearm, 53% hand, 10 % neck, 6 % groin



FIGURE 3. Anatomic relations of the subclavian and internal jugular veins and the sternoclavicular joint, showing possible routes of bacterial invasion of the joint.

Acupuncture related SC septic arthritis?



FIGURE 3. Anatomic relations of the subclavian and internal jugular veins and the sternoclavicular joint, showing possible routes of bacterial invasion of the joint.

OR

Direct inoculation

- 肩井穴：肩酸痛、頭酸痛、頭重腳輕、眼睛疲勞、耳鳴、高血壓、落枕等