Emergency in oncology

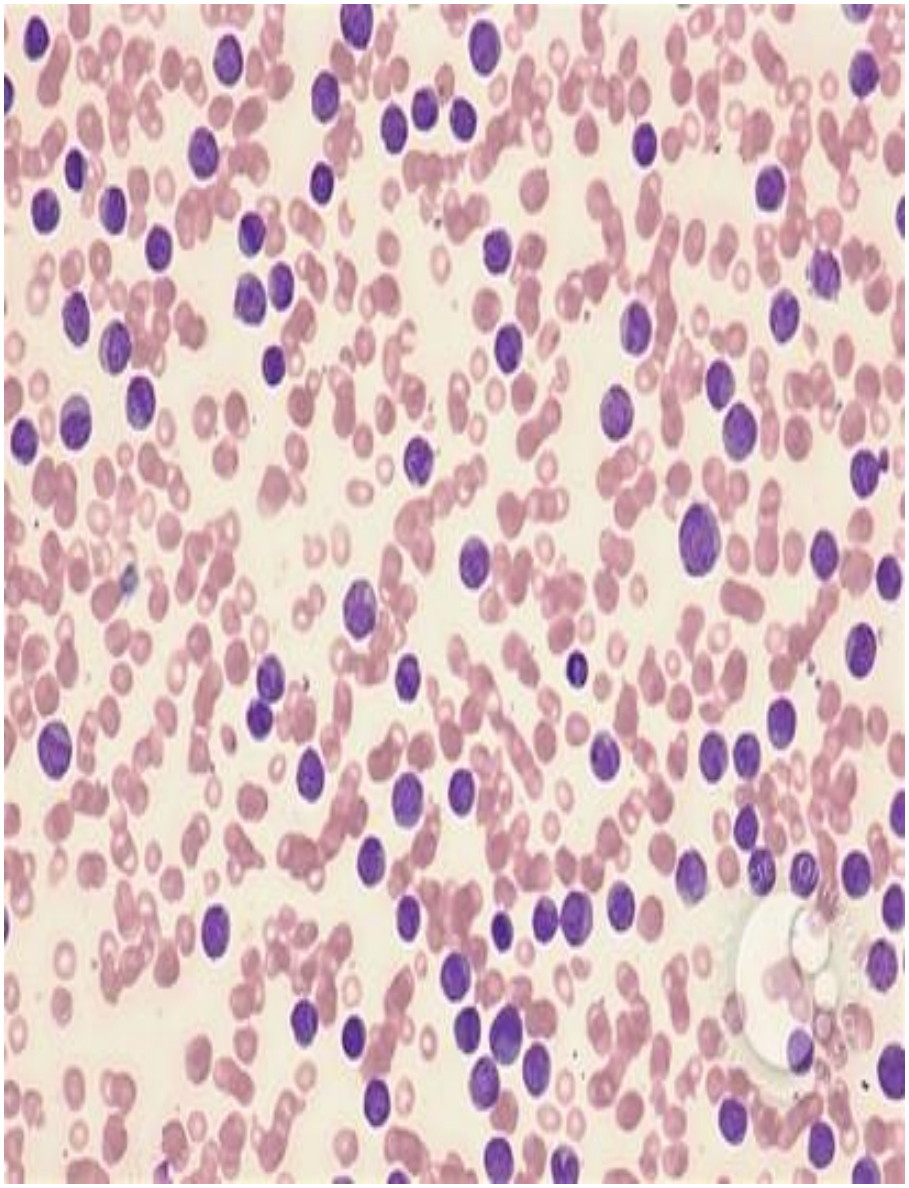
Topics in Oncologic Emergencies

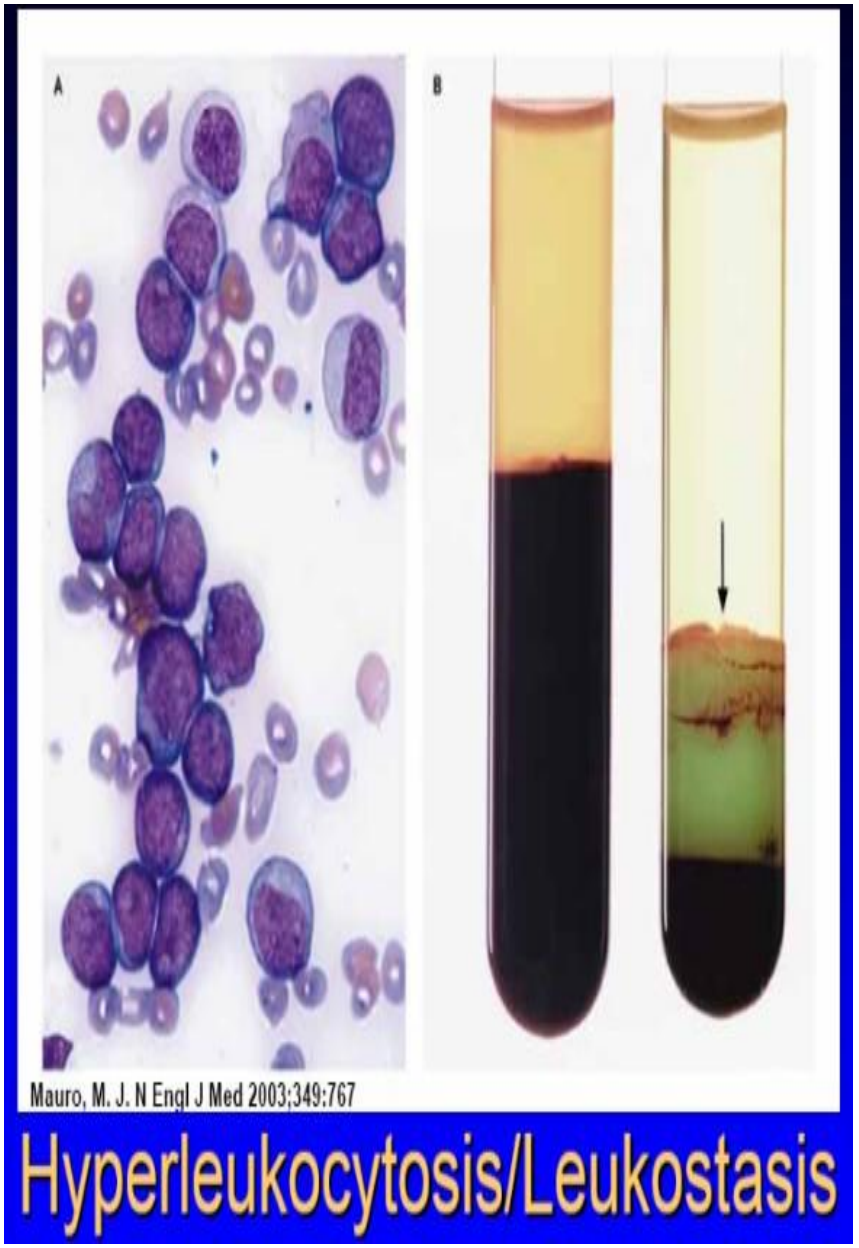
- Metabolic emergencies
  - Tumor lysis syndrome
  - Hypercalcemia
  - Hyponatremia
  - Hypokalemia
  - Adrenal insufficiency
  - SIADH
- Hematologic emergencies
  - Hyperleukocytosis
  - Cytopenias
  - Coagulopathy, DIC
  - Thrombosis
- Infectious emergencies
  - Febrile neutropenia
  - Typhlitis
  - Fungal infection
  - Specific infection : PCP, VZ,
  - pancreatitis
- Structural emergencies
  - Spinal cord compression
  - Cerebral herniation
  - Seizure, CVA
  - SVC obstruction
  - Cardiac temponade

Hyperleukocytosis

- **WBC > 100,000 / μl**
- **symptomatic when**
  - **ALL : > 300,000 (T cell, infant)**
  - **ANLL > 100,000-200,000**
  - **CML > 600,000**

Hct + leukocrit = cytocrit

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Mauro, M. J. N Engl J Med 2003;349:767
Hyperleukocytosis/Leukostasis

Hyperleukocytosis

- **Increases blood viscosity → thrombi in microcirculation**
- **Respiratory failure**
  - **stasis in pulmonary vasculature**
  - **release of intracellular contents → diffuse alveolar damage**
- **Hemorrhage**
  - **CNS, GI, pulmonary, pericardial**
  - **coagulopathy in M3, M4, M5**

Management of Hyperleukocytosis

- Tumor lysis syndrome precaution
- Platelet transfusion, keep Plt > 20,000
- Avoid PRC transfusion (keep Hb < 8-10 gm/dL)
- Exchange transfusion or leukapheresis
- Avoid diuretics :
- Specific treatment : chemotherapy

Leukapheresis

- **https://youtu.be/yPMK0qPTO58**
- https://youtu.be/yPMK0qPTO58

Tumor Lysis Syndrome

cell death and release of intracellular ions

metabolic complications

Hyperuricemia
Hyperphosphatemia
Hyperkalemia
Hypocalcemia
Renal failure.

Introduction

- A life-threatening condition that results drom rapid destruction of malignant cells
  - Bulky
  - Rapidly proliferating tumor
  - Highly chemo- and radiotherapy
- Incidence: 3 – 25% depending on diagnosis

Definitions

Metabolic abnormality	Criteria for classification of laboratory TLS	Criteria for classification of clinical TLS
Hyperuricemia	UA > 8 mg/dL	
Hyperphosphatemia	In.P > 4.5 mg/dL (adults) In.P > 6.5 mg/dL (children)	
Hyperkalemia	K > 6 mmol/L	Cardiac dysrhythmia or sudden death probably caused by hyperkalemia
Hypocalcemia	corrected Ca < 7 mmol/L, iCa < 1.12 mmol/L	Cardiac dysrhythmia, seizure, death, sudden death, irritability, laryngospam, Trousseau's sign, Chvostek's sign, hypotension, heart failure
Acute kidney injury	Not applicable	increase in sCr > 0.3 mg/dL sCr > 1.5 x normal limits Oliguria < 0.5 ml/kg/hr for 6 hr

Clinical Presentation

- GI symtoms: nausea, vomiting
- Renal symptoms: oliguria, edema, fluid overload
- Cardiac abnormalities: CHF, arrhythmia
- Neuromuscular symptoms: tetany, cramping, lethargy
- Sudden death

Treatment and Supportive Care

- Supportive care is the key management
  - Hydration 2500-3000 ml/m2/day
  - Alkalinized urine by add Sodium bicarbonate keep urine PH>6.5
  - Close monitoring:

    weight, fluid balance, cardiac monitoring
  - Follow-up blood work

    (at least every 24 hr, but every 4 – 6 hr in diagnosed TLS and/or high risk patients)

Treatment and Supportive Care (2)

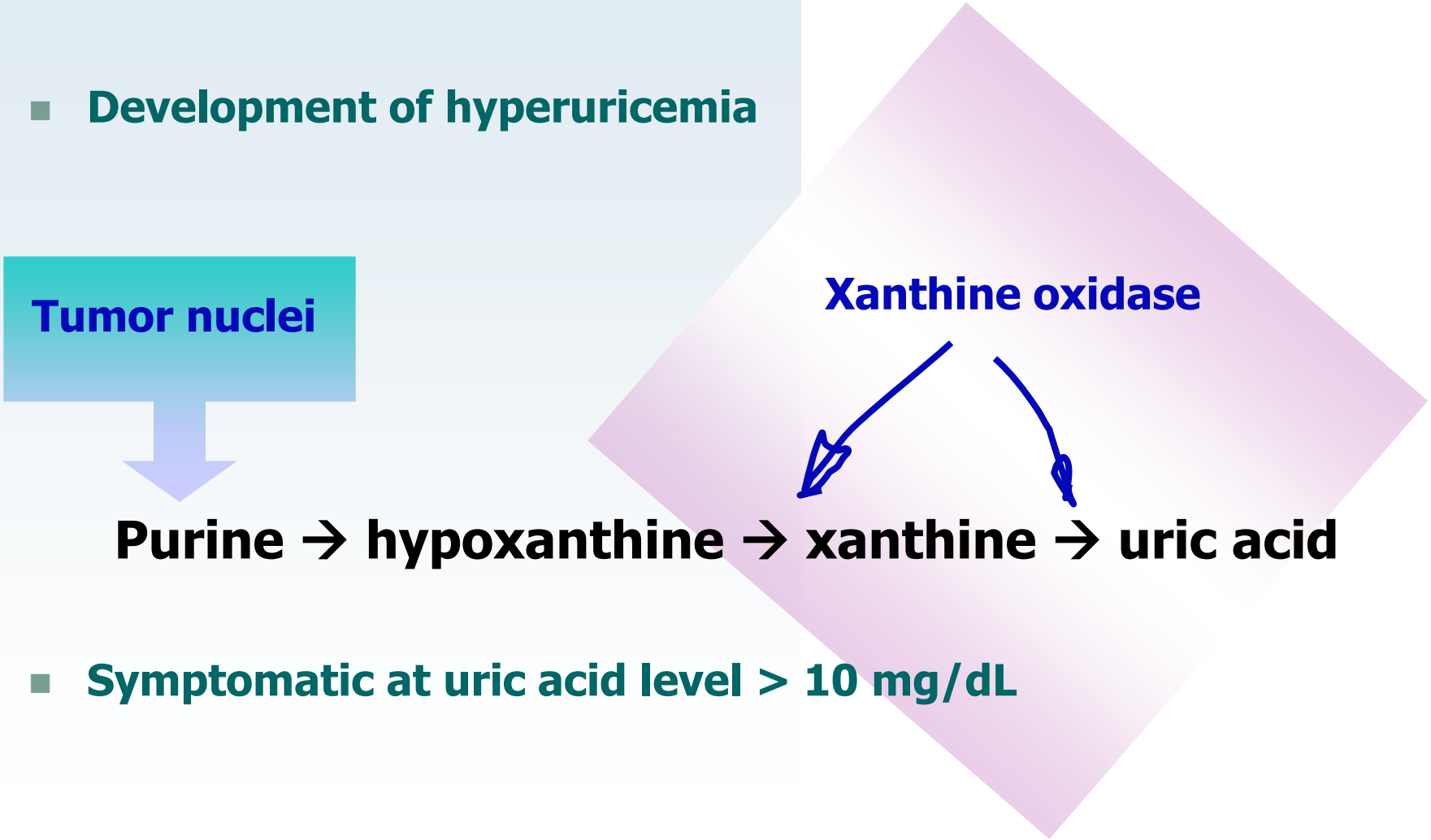
- Hyperkalemia
  - Hyperhydration and cardiac monitoring
  - Calcium gluconate i.v.
  - Glucose and i.v. insulin
  - Na polystyrene sulfonate, kayexalate
  - Hemodialysis
- Hyperphosphatemia
  - Hyperhydration
  - Discontinue phospahte supplementation
  - Phosphate binders ($Al(OH)_3$
  - Hemodialysis

Treatment and Supportive Care (3)

- Hypocalcemia
  - i.v. calcium gluconate
- Hyperuricemia
  - Allopurinol (xanthine oxidase inhibitor)
    - Precaution of xanthine precipitation
    - 10 mg/kg/day, divided every 8 -24 hr
  - Rasburicase (urate oxidase): xanthine → allantoin
    - Highly effective,High cost
    - Contraindicated ing G6PD deficiency

Pathophysiology of TLS

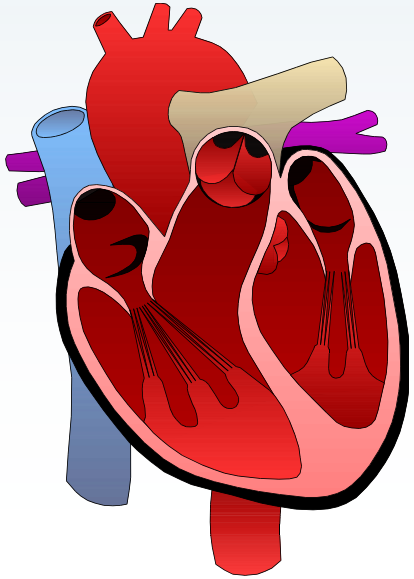
- Development of hyperuricemia

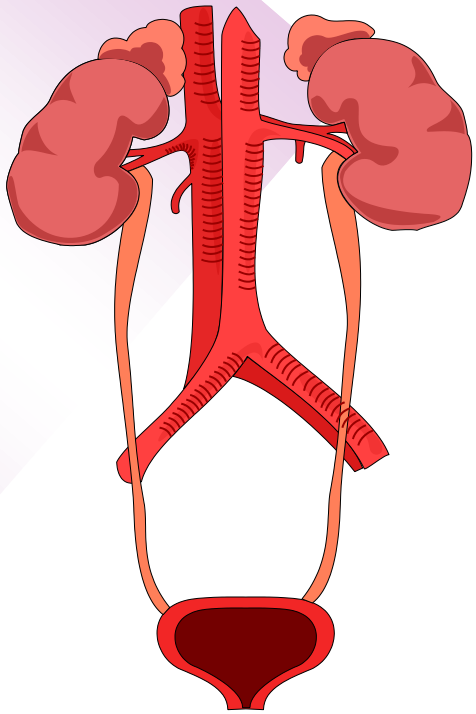


- Symptomatic at uric acid level > 10 mg/dL

Evaluation and monitoring

- **Electrolytes** — Na, K, Cl, HCO_3 uric a, Ca^{+2}, PO_4^{-2}
- **BUN, creatinine**
- **EKG** — widen QRS, peaked T waves
- **urinalysis** — pH, sp.gr.,





Hypercalcemia

- 3 main causes:
  1. Osteolytic bone lesions (particularly in T-cell leukemia and lymphoma)
  2. Bone demineralization secondary to parathyroid-like factors (paraneoplastic syndrome)
  3. Immobilization.

Hypercalcemia *"common etiology"*

- lymphomas
- Leukemias
- rhabdomyosarcoma
- neuroblastoma
- Ewing's sarcoma
- Wilms tumor and Rhabdoid tumor of the kidney

Hypercalcemia *"paraneoplastic syndrome"*

- **Neurologic**
  - headache, irritability, seizures, lethargy, hypotonia, coma
- **GI**
  - Nausea, vomiting, anorexia, constipation, ileus, abdominal pain
- **Cardiac**
  - hypertension, bradycardia, arrhythmia
- **GU**
  - polyuria, polydipsia, nocturia

Management of Hypercalcemia

Management/ objective	Guidelines
Hypercalcemia	Dehydration and electrolyte disturbances should be corrected.
	Renal calcium excretion should be increased by inducing diuresis with normal saline at two- to threefold maintenance and furosemide 1–2 mg/kg/dose q 6 hour
	Calcium mobilization from bone should be decreased by: - Bisphosphonates: pamidronate 0.5–1 mg/kg IV over 4 hours - Prednisone 1.5–2.0 mg/kg daily (in lymphoproliferative disorders) - Calcitonin 0.5–1.0 units/kg daily - Mithramycin 10–25 µg/kg daily

Syndrome of Inappropriate Antidiuretic Hormone Secretion(SIADH)

- Results from physiologic stress, pain, surgery, mechanical ventilation, infections,CNS and pulmonary lesions, lymphomas, and leukemias
- Occurs as a side effect of VCR, CTx, ifosfamide, cisplatin,melphalan
- continuous pituitary release of ADH
- hypo-osmolality and water intoxication

If not successfully treated

Cardiac arrhythmias
Seizures
DIC

renal failure,
coma
death

SIADH

Clinical Features

- Oliguria, weight gain
- Fatigue, lethargy, confusion, seizures, coma.

Laboratory Features

- Hypo-osmolality (<280 mOsm/L)
- Hyponatremia (sodium, <135 mEq/L)
- Increased urine specific gravity

SIADH

Treatment

- Fluid restriction; hydrate with NSS : insensible losses(500 mL/m2/24 hr) plus ongoing losses.

In case of severe neurologic involvement (seizures or coma)

1. Hydrate with hypertonic saline 3%.
2. Furosemide 1 mg/kg : to increase diuresis.
3. The rate of sodium correction should be limited to 2 mEq/L/h

Oncologic Emergencies by Anatomic Region

- Thoracic Emergencies
- Abdominal Emergencies
- Neurologic Emergencies

Thoracic Emergencies

- Superior vena cava syndrome (SVCS) consists of the signs and symptoms of superior vena cava (SVC) obstruction.
- Superior mediastinal syndrome (SMS) consists of tracheal compression

Thoracic Emergencies : Etiology

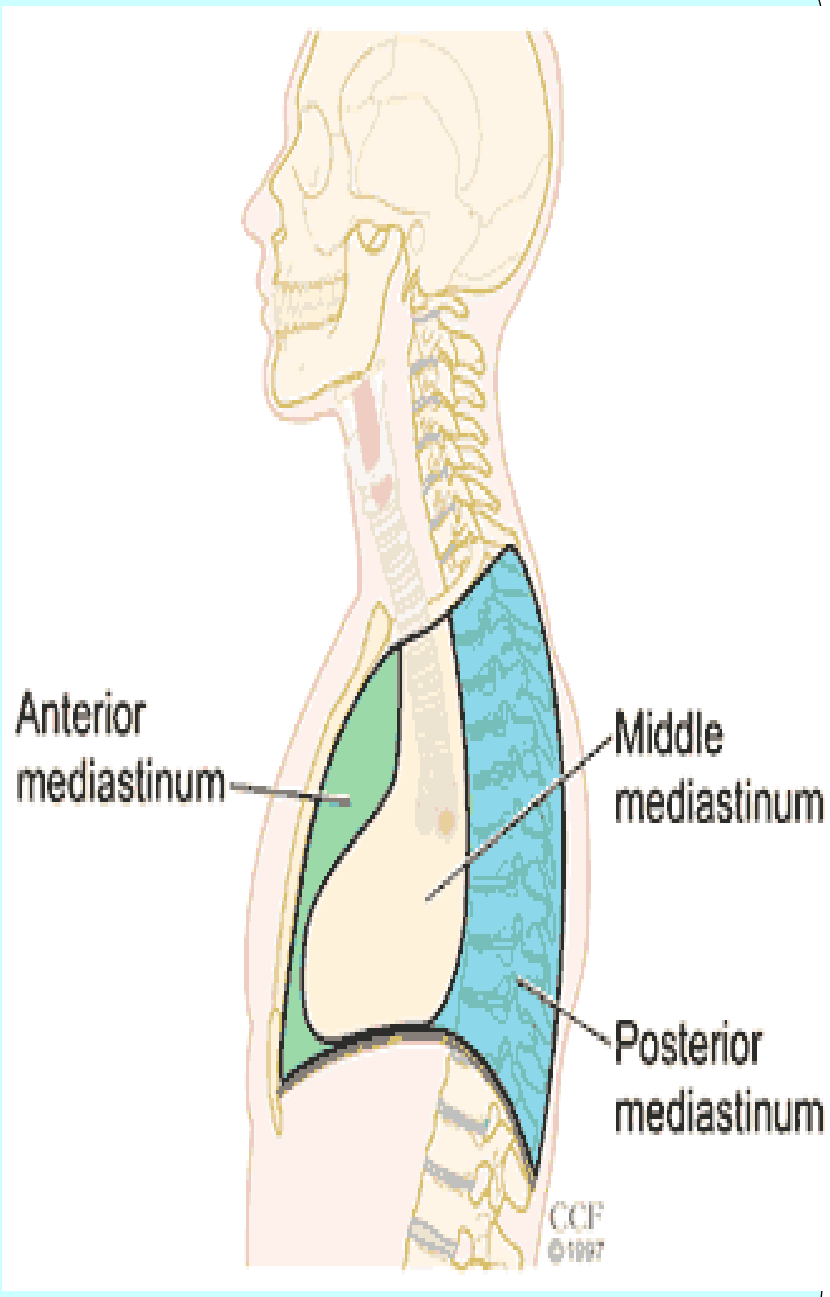
1. Intrinsic causes: catheter related vascular thrombosis
2. Extrinsic causes: malignant anterior mediastinal tumors : lymphoma, Teratoma or other germ cell tumor, Thyroid cancer, Thymoma.

Thoracic Emergencies : Clinical Features

SVC obstruction:

- Swelling, plethora, and cyanosis of the face, neck, and upper extremities
- Suffusion of the conjunctiva
- Engorgement of collateral veins

SMS: cough, hoarseness, dyspnea, orthopnea, wheezing, stridor, and chest pain. Supine position worsens symptoms.


Anterior
mediastinum
Middle
mediastinum
Posterior
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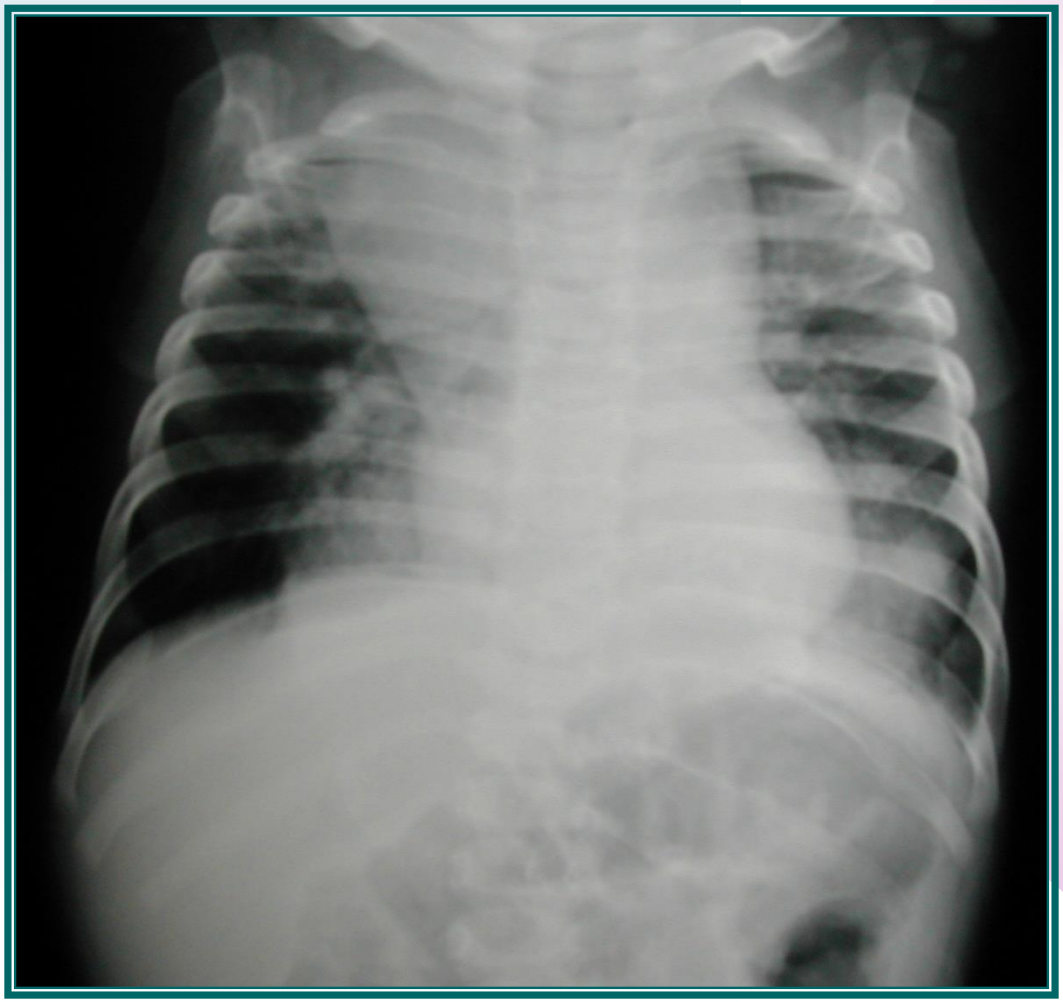
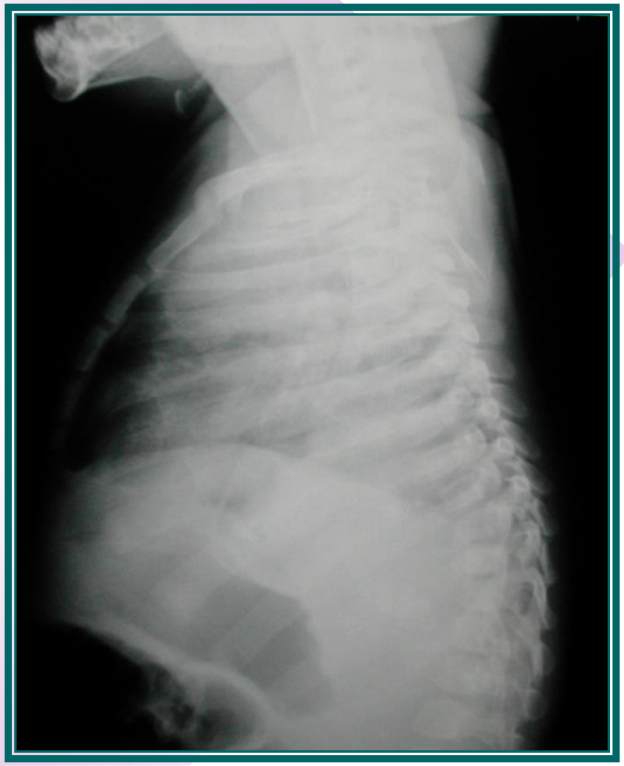
Superior mediastinal mass





3S which may precipitate Respiratory Arrest

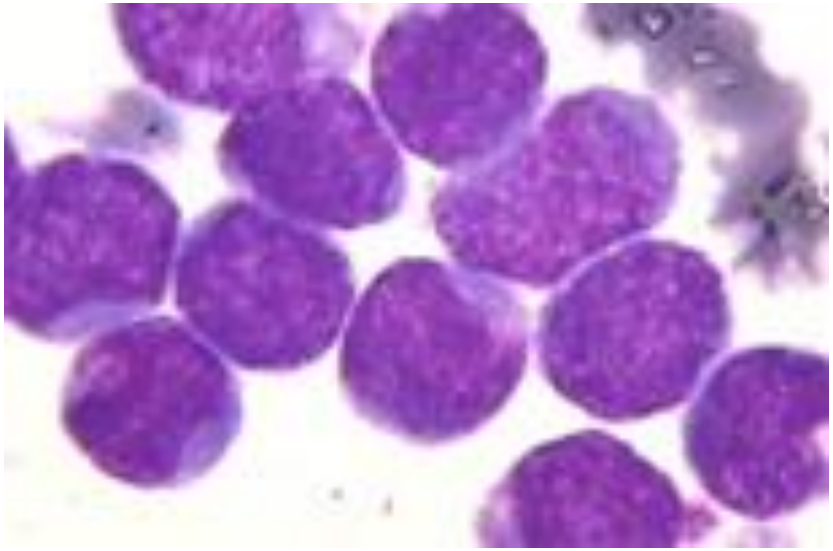
- **S**upine position
- **S**tress
- **S**edation

Thoracic Emergencies : Management

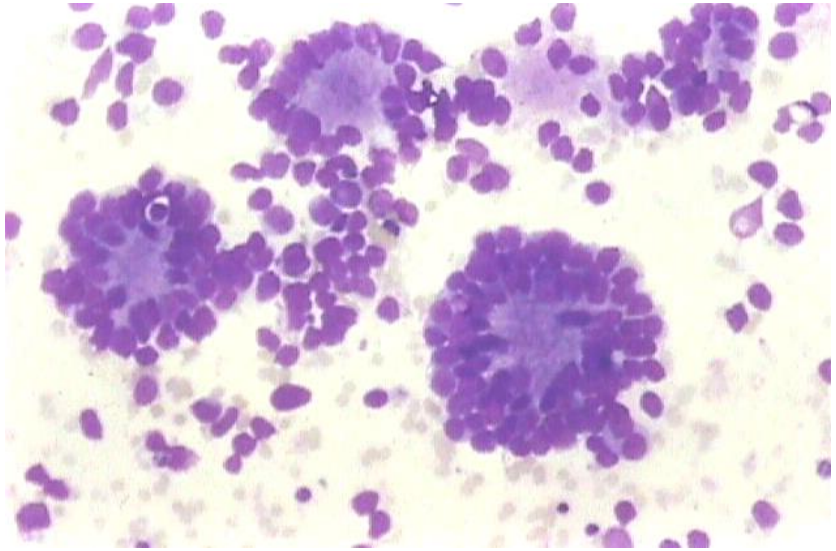
Diagnosis :made quickly ;least invasive manner.

- Radiograph and CT of the chest.
- CBC, BMA-Bx, tumor marker.
- A tissue diagnosis is desirable. Because of the risk of anesthesia, the least invasive technique possible (such as fine-needle aspiration, pleurocentesis, pericardiocentesis) should be used.

BM Aspiration



- **Lymphoma**



- **neuroblastoma**

Tumor Markers

- **LDH : Lymphoma**
- **NSE : neuroblastoma, Ewing's sarcoma, PNET**
- **AFP, βHCG : germ cell tumors**

LDH = lactate dehydrogenase
NSE = neuron specific enolase
AFP = alphafetoprotein
βHCG = beta subunit Human Chorionic Gonadotropin

Thoracic Emergencies : Therapy

- For thrombosis, a continuous infusion of tissue plasminogen activator (tPA) to lysing the clot, heparin to prevention further clot formation
- radiotherapy and steroids.

Abdominal Emergencies

- Esophagitis
- Gastric hemorrhage
- Typhlitis: seen only in neutropenic patients
- Perirectal abscess: in prolonged neutropenia
- Hemorrhagic pancreatitis: especially in patients on L-asparaginase therapy
- Massive hepatic enlargement from tumor: especially in infants with stage IVS neuroblastoma.

Typhlitis

- Typhlitis is usually diagnosed clinically
- necrotizing colitis localized in the cecum
- strongly suspected in patients with right lower quadrant pain and mass
- Bacterial invasion →inflammation → fullthickness infarction → perforation→ peritonitis→ septic shock

Abdominal Emergencies: Diagnosis

Radiograph of the abdomen	may reveal pneumatosis intestinalis or bowel wall thickening
Ultrasonography	may reveal thickening of the bowel wall in the region of the cecum
CT scan	may demonstrate diffuse thickening of the cecal wall

Abdominal Emergencies: Treatment

- Discontinuation of oral intake
- Nasogastric tube suctioning
- Broad-spectrum antibiotics
- Intravenous fluid and electrolytes
- blood transfusion
- Vasopressors, as needed (hypotension is associated with a poor outcome).

Abdominal Emergencies:Treatment

Indications for surgical intervention:

- Persistent GI bleeding despite resolution of neutropenia and thrombocytopenia
- Evidence of free air in the abdomen on abdominal radiograph (indicating perforation)
- Surgery consists of removing necrotic portions of the bowel and diversion via colostomy.

Spinal Cord Compression

- The spinal cord can be compressed by tumor in the epidural or subarachnoid space or by metastases within the cord parenchyma.
- 3-5 % of children with cancer

Spinal Cord Compression: Clinical presentation

- Back pain with localized tenderness : 80%
- Incontinence, urinary retention, and other abnormalities of bowel or bladder function are frequent.
- Loss of strength and sensory deficits with a sensory level may also occur.

Ewings Sarcoma

PNET

Peripheral Neuro-epithelioma Tumor

Spinal Cord Compression: Treatment

- Dexamethasone: 0.25-2 mg/kg/day q6h
- Emergency MRI
- epidural mass :rapid decompression ; Chemotherapy, radiation therapy, or surgical decompression

ง่วงกันยังคะ

Febrile neutropenia

Definition

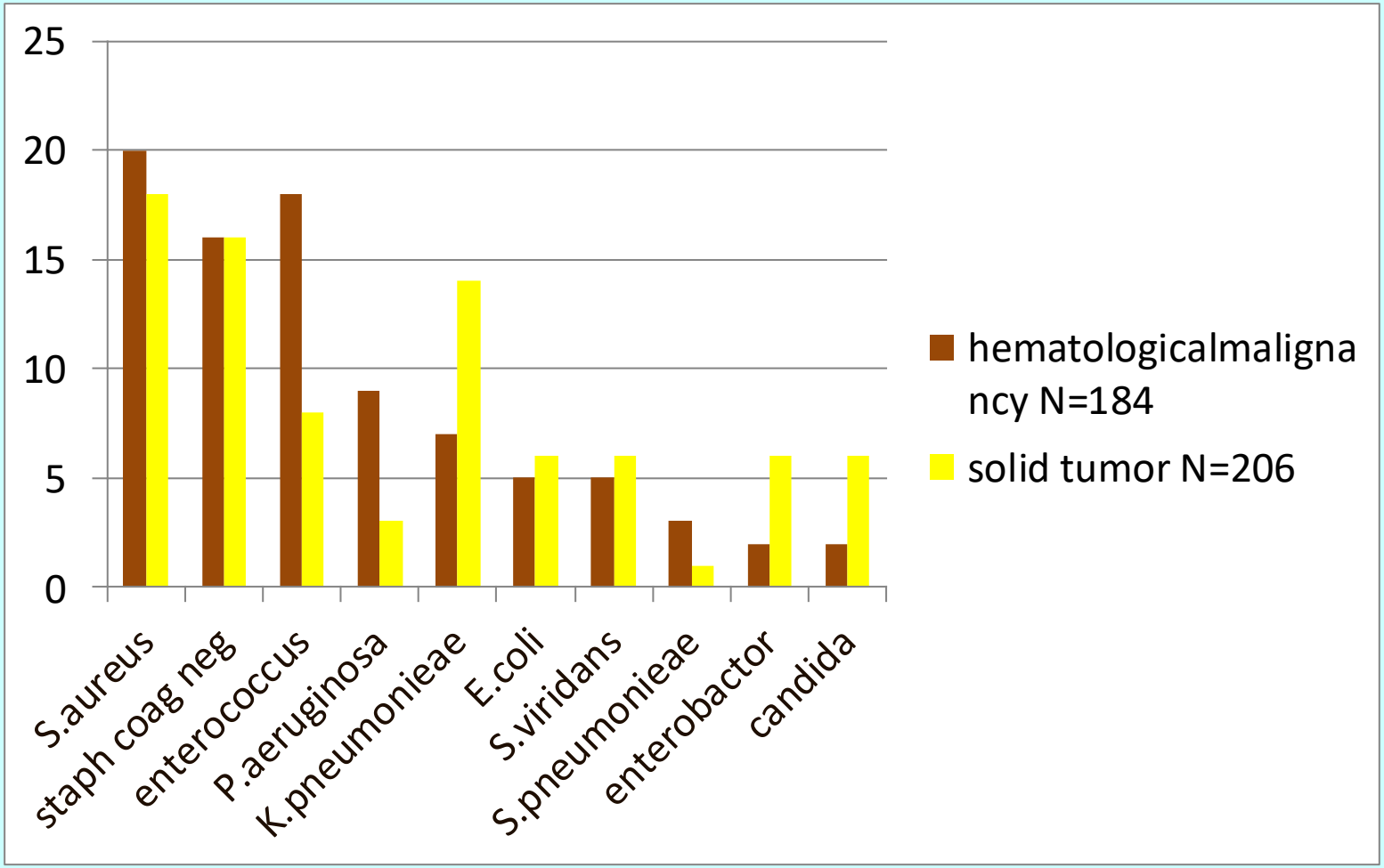
- Fever :
  - เมื่อวัดอุณหภูมิทางปากแล้วมีไข้ ≥38.3 C (101 F) หรือ > 38.0 C (100.4 F) นานมากกว่า 1 ชม.

Hughes et al. Clin Infect Dis. 2002;34:730-751; Hughes et al. J Infect Dis. 1990;161:381-396; Pizzo. N EnglJ Med. 1999;341:893-900.

Definition

- Neutropenia :
  - Absolute neutrophil count (ANC)
    - < 500 cell/mcL or
    - <1000 cell/mcL with a predicted decrease to < 500 cell/mcL
  - ANC = total leukocytes count x (% neutrophils+band cells)

COMMON BACTERIAL



COMMON BACTERIAL

- **Gram-positive**
  - ***S. aureus***
  - **Coagulase negative staphylococci**
  - ***S. pneumonia***
  - ***S. pyogenes***
  - **Viridans group**
  - ***Enterococcus sp.***
  - ***Corynebasterium sp.***
- **Gram-negative**
  - ***E. coli***
  - ***Klebsiella sp.***
  - ***Pseudomonas aeruginosa***

Mortality

- Overall mortality: 0.5 – 6.6% mortality (children)
  - 5% in patients with solid tumors
  - 11% in patients with hematologic malignancies
  - Worse in patients with proven bacteraemia
    - 18% in gram negative bacteraemia
    - 5% in gram positive bacteraemia

Case study 1

- Case 7 year-old thai girl with ALL
- Admit on Nov 8th 2014
- Chief complaint : fever 5 hr PTA

History

7 day PTA (Nov,1 th 2014) she received a last CMT, no complication during receiving

5 hr PTA she had fever ,malaise ,headache ,she did not have any other significant symptom so that her mom took her to the hospital

Physical examination

- Vital signs : T 38.8 , P 130 , BP 102/82 , RR 24
- BW 20 kg , Ht 123 cm
- GA : alert, not pale , no jaundice ,no lymphadenopathy
- Skin : no petechiae , no ecchymosis
- HEENT : eye -no conjunctival injection

  ear- both TM not seen,ear canal not injected,no discharge per ear

  nose- no discharge , nasal cavity no edema/erythema

Physical examination

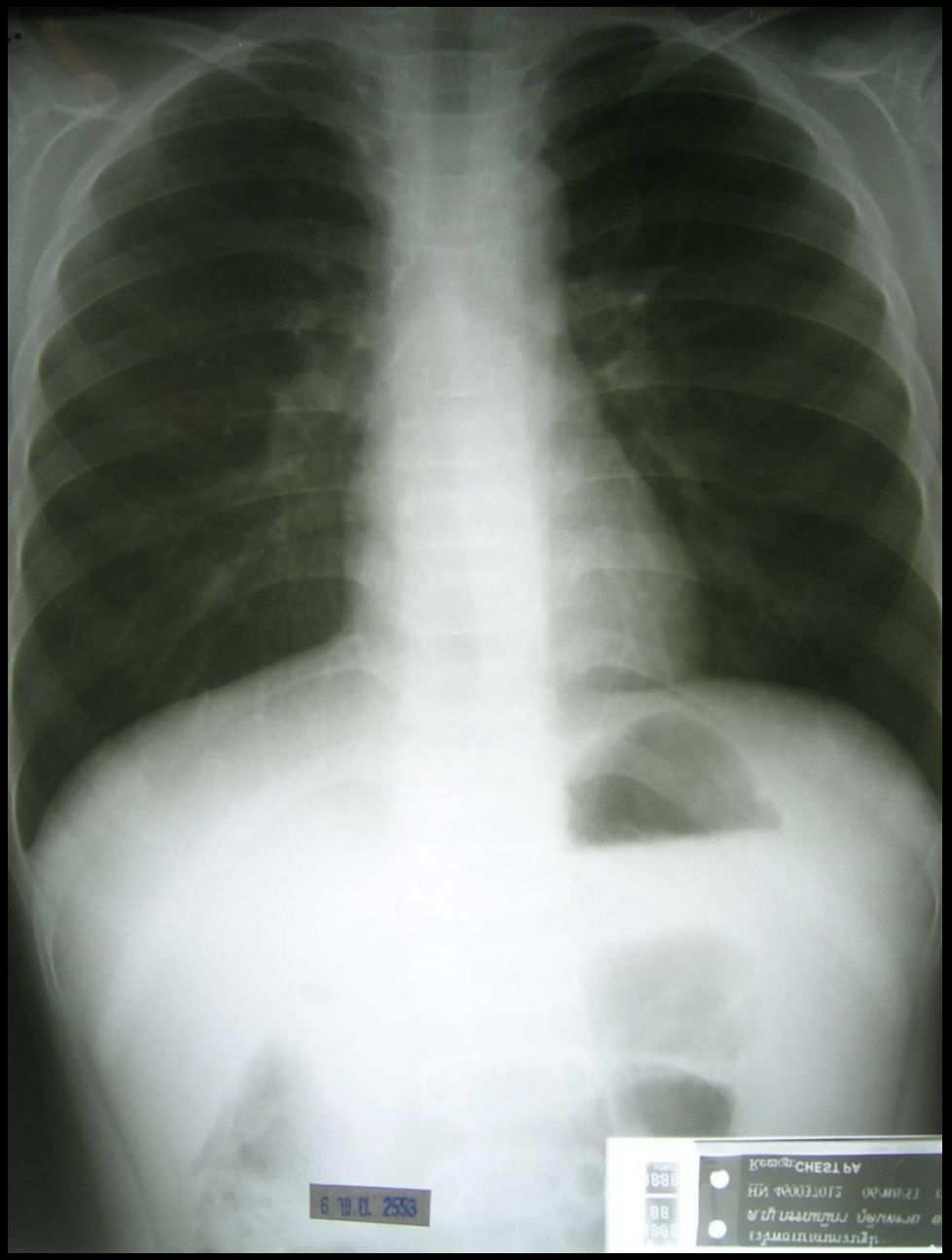
- HEENT :

  throat-no pharyngeal injection,tonsil 1+ no exudate

  mouth-dental carries at upper premolar tooth
- RS : nomal breath sound , no adventitious sound
- CVS : normal S1S2 , no murmur
- Abd : soft , no tenderness , liver ≈ 1 FB BRCM ,spleen can’t be palpated
- NS : E4V5M6 ,pupil 2 mm BRTL

Investigation

- CBC : Hb 11.7 , Hct 33.4 , WBC 900 , N 41.2 (ANC= 369), % L31.1 %, M 24.4 %, E 2.2 %, B 1.1 ,Plt 147,000
- Electrolyte : Na 132 , K 3.08 , Cl 100 , HCO3 19.7
- U/A : yellow , Sp.gr 1.025 , prot&sugar –ve , RBC - , WBC 0-1 ,sq.epithelium 0-1
- H/C, U/C : pending,
- CXR : no infiltration
- Melioid titer negative



-no lung infitration
-normal heart size

Problem list

- 1.Fever 5 hr PTA
- 2.Lab : leukopenia with neutropenia
- 3.ALL ,last CMT 7 day PTA

Impression : febrile neutropenia with underlying ALL

Treatment

- In this patient
  - suspected source of infection was dental caries
  - She was low risk
  - Empirical ATB she received were
    - Ceftazidime(150mg/kg/day) 1 g IV q 8 hr
    - Amikin(15 mg/kg/day) 100 mg IV drip in 8 hr

Progression ,9 Nov (day2)

- S : active,some peak of fever,no headache,no dyspnea,no dysuria,no diarrhea,no cough,no rhinorrhea
- O : v/s-T 36.7 to 38.5 ˚C , P 95, BP 100/70,RR 25

  PE: WNL
- A&P : Febrile neutropenia

  plan - cont ATB

Progression ,10 Nov (day3)

- S : active,afebrile,no headache,no dyspnea,no dysuria,no diarrhea,no cough,no rhinorrhea
- O : v/s-T 36.4 to 37.5 ˚C , P 100, BP 100/80,RR 26

  PE :WNL
- A&P : Febrile neutropenia

  - improved ; no fever,no clinical manifestration

  plan - cont ATB ,F/U CBC ,electrolyte tomorrow

Progression 10, Nov (day4)

- S : active, afebrile, no headache
- O : v/s-T 36.4 to 37.3 ˚C , P 95, BP 110/60,RR 24

  PE WNL
- A&P : Febrile neutropenia

  F/U CBC – Hb 10 ,Hct 27.8 , WBC 2000 , Plt 105000 ,
  PMN 58% (ANC 1016) , L76%

  E'ltyte – Na 136 ,K 3.4 , Cl 100.4 , HCO3 25.4

  Lab : H/C no growth in 2 days

  plan- discharge, oral antibiotic

Guideline

- Initial assessment
- Initial investigations
- Empirical antibiotics
- Re-evaluation

Febrile Neutropenia after Chemotherapy in Pediatric hematologic malignancy patient

Temp ≥ 38.3 °C หรือ Temp ≥ 38.0 °C นาน ≥ 1 hr และ ANC <500 หรือ ANC = 500-999 และ มีแนวโน้มลดลงภายใน 48 hr

Temp ≥ 38.0 °C หลังรับเคมีบำบัด

รับเคมีบำบัดภายใน 7-14 วัน ระยะเวลาที่เริ่มมีไข้

ซักประวัติอาการและอาการแสดง

ตรวจหาตำแหน่งของการติดเชื้อ

ประเมินภาวะเสี่ยง (Risk Assessment)

Low Risk Patient

ผู้ป่วยรู้สึกตัวดี
V/S stable ไม่มีอาการและอาการแสดงของภาวะช็อค

High Risk Patient

ผู้ป่วยระดับความรู้สึกตัวเปลี่ยนแปลง
V/S unstable
มีอาการและอาการแสดงของภาวะช็อค

ให้ 0.9 % NSS Resuscitation

ตรวจ Lab
CBC, H/C 1 ขวด

ส่งขวด H/C มาพร้อมกับรถ Refer ได้

Stat Antibiotics in 1 hr หลังแพทย์วินิจฉัย ไม่ต้องรอผล CBC
Ceftazidime 50 mg / kg /dose ร่วมกับ Amikacin 5 mg/kg/dose
หรือ Ceftriazone 50-75 mg /kg /dose

Refer รพ.สรรพสิทธิประสงค์ (พร้อมผล CBC)

High Risk Patient ประสาน ICU Hub ก่อนส่ง Refer

เครือข่ายเคมีบำบัด
เขตสุขภาพที่ 10
16 กันยายน 2558

พัฒนาแนวปฏิบัติ โดย
PCT กุมารเวชกรรม
รพ.สรรพสิทธิประสงค์

Febrile Neutropenia after Chemotherapy in Pediatric hematologic malignancy patient

Temp ≥ 38.3 °C หรือ Temp ≥ 38.0 °C นาน ≥ 1 hr และ ANC <500 หรือ ANC = 500-999 และ มีแนวโน้มลดลงภายใน 48 hr

ER,OPD evaluated low risk, high risk

ส่ง CXR admit ทุกราย

Low Risk Patient

High Risk Patient

Admit เด็ก 5

ซักประวัติ ตรวจร่างกาย

วัด V/S O2 sat

Lab: CBC BUN Cr DTX Electrolyte LFT H/C Ca Mg UA U/C melioid titer

Admit PICU1 or PICU2 (isolated room)

Stat Antibiotics in 1/2 hr

Ceftazidime 4500 mg / m2 /day +
Amikacin 15 mg/kg/day

F/U CBC 3 day

Re evaluate

Stat Antibiotics in 1/2 hr

Meropenem 60-100mg / kg /day+
Amikacin 15 mg/kg/day
(If septic chock add vancomicin 60 mg/kg/day)

ไม่มีไข้ ANC1000 H/C NG เปลี่ยนเป็น oral AB

v/s stable ย้ายเด็ก 5 ให้ ATB 10-14 days

Progressive consult ID

Febrile > 5-7 days add anti fungal

Assessment

- History
  - **Underlying disease(s) *****
  - Symptoms
  - Concurrent steroid use
  - Recent surgical procedure, drug allergy
  - Previous history of central venous catherization (CVC)
  - Previous history of infection
- Physical examination

Risk Factors

- **Low risk:** T < 39°C, monocyte count ≥ 1000/uL, lack of medical comorbidity, lack of evidence of pneumonia, OPD status at time of FN, anticipated duration ≤ 5 days
- **High risk:** Duration ≥ 10 days, < 7 days between last chemotherapy and onset of FN, pneumonitis, severe mucositis, shock, dehydration, respiratory distress, MOF, treatment with high dose cytarabine, CRP ≥ 90 mg/L, ANC < 100/uL

Initial Investigations

- Urgent blood testing
  - Complete blood count (CBC)
  - Blood cultures
  - Urinalysis (UA) and culture
  - Sputum microscopy and culture
  - Stool microscopy and culture
  - Skin lesion (aspirate/biopsy/swab)
  - Chest radiograph

Empirical Antibiotics

- Monotherapy
- Combined antibiotics without vancomycin
- Combined antibiotics with vancomycin

Initial Antibiotic Therapy for Low Risk FN

- Ceftazidime 4500 mg/m^2 q 8 hr, (max 6g/day) or 150 mg/kg/day

Plus Amikacin 15 mg/kg/day q 8 hr

Or monotherapy 4 th cephalosporin

- Cefepime 1500 mg/m^2 q 8 hrs

Initial Antibiotic Therapy for High Risk FN

- Meropenem or Tienem 60-120 mg/kg/day q 8 hr, (max 6g/day)
  Plus Amikacin 15 mg/kg/day q 8 hr
- If severe mucositis add vancomycin

Fungal Infections in Patients with Fever and Neutropenia

- Not common in initial management
- **Predisposing factors include**:

  - Prolonged myelosuppression
  - Broad-spectrum antibiotic therapy
  - Disruption of mucosal and skin barriers
  - Indwelling venous catheters

  -Widespread use of antifungal prophylaxis will likely change spectrum of pathogens

Specific Indications for Alternative Therapy

- The presence of CVCs
- Pneumonia
- Cellulitis
- Intra-abdominal or pelvic sepsis
- Diarrhea
- Candidiasis
- Suspected CNS infection

Daily Follow-up and Assessment of Response

- Daily assessment of
  - Fever trends
  - Bone marrow function
  - Renal function
- Persistent fever
  - Slow response
  - Resistant pathogens to treatment regimen
  - Superimposed infection
  - Inadequate/improper antibiotics (suboptimal dose)

Discontinuation of Antibiotics

- Afebrile on day 3 and
  - Afebrile for 24 – 48 hr
  - No identifiable source of fever
  - Sterile blood culture
  - Evidence of BM recovery

  Stop antibiotic therapy

Discontinuation of Antibiotics (2)

- If no evidence of BM recovery
  - Low risk: continue ATB until afebrile 5 – 7 days
  - High risk: continue ATB until recovery of ANC
- Persistent fever on day 3 with
  - ANC ≥ 500/uL: continue ATB until 4 – 5 days after ANC ≥ 500/uL, reassess
  - ANC < 500/uL: continue ATB ≥ 2 weeks, reassess, stop if no disease sites found

Case study 2

- Case 10 year-old thai girl with relapse germ cell tumor
- Admit on May 5th 2015
- Chief complaint : fever 4 days PTA

History

10 day PTA (Nov,1 th 2014) she received a last CMT, no complication during receiving, (she had pulmonary metastasis from germ cell tumor 2 months ago)

4 days PTA she had fever ,cough ,tachypnea , so that her mom took her to the distinct hospital, she was admitted and received IV antibiotic (CEF -3), CBC ANC 150

1 days PTA she progessed tachypnea and Still had fever, the doctor refered to Sunpas

Physical examination

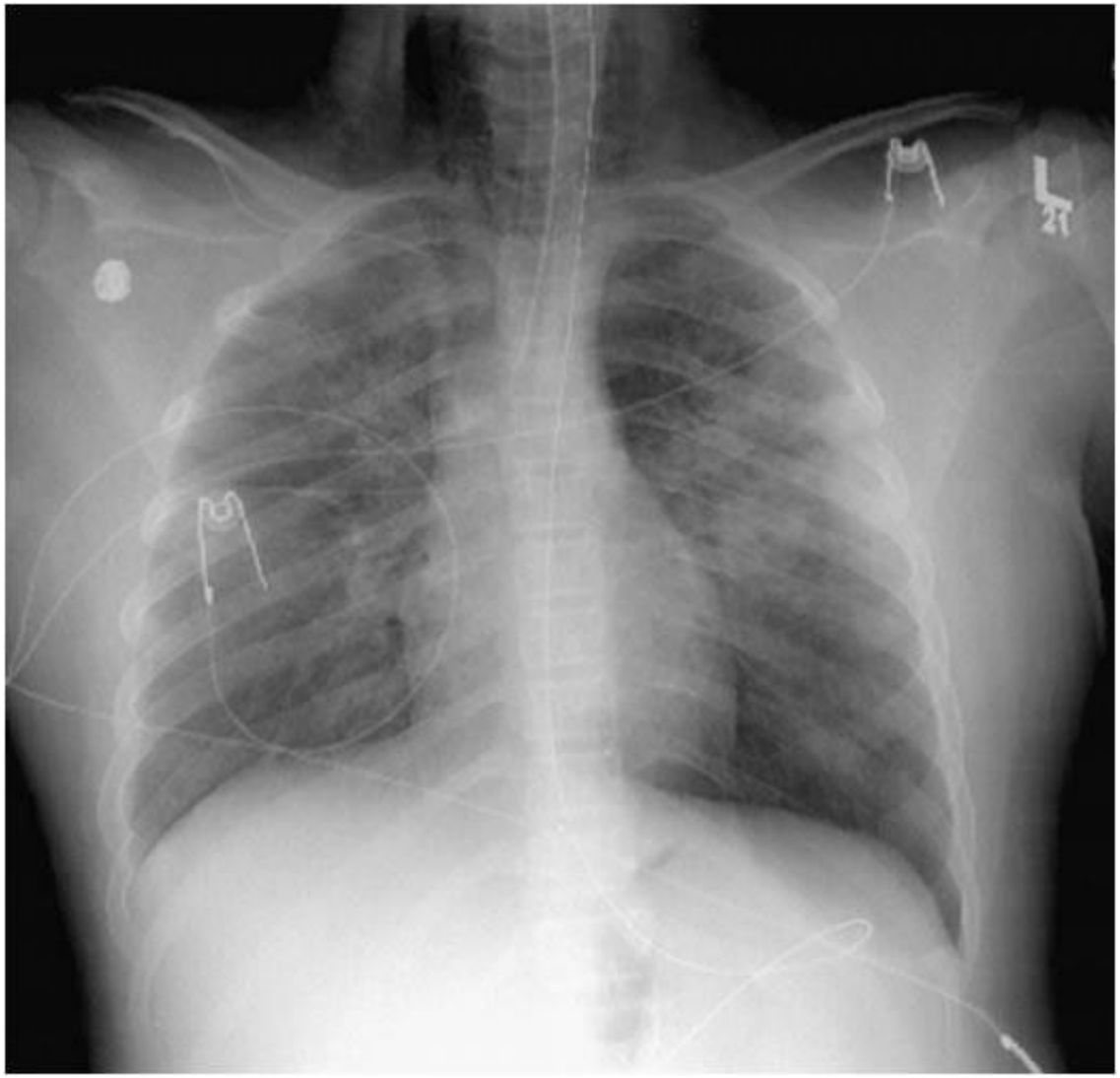
- Vital signs : T 38.8 , P 140 , BP 90/60 , RR 40
- BW 30 kg , Ht 143 cm
- GA : Tachypnea, no cyanosis, not pale , no jaundice ,no lymphadenopathy
- Skin : no petechiae , no ecchymosis
- HEENT :moderated pale, no jaundice

Physical examination

- RS : suprasternal retraction, fine cerpitation both lung
- CVS : normal S1S2 , no murmur
- Abd : soft , no tenderness , liver and spleen can’t be palpated
- NS : E4V5M6 ,pupil 2 mm BRTL
- Skin no rash

Investigation

- CBC : Hb 8.7 , Hct 23.4 , WBC 2000 , N 10 (ANC= 200), % L70 %, M 7 %, E 3 %,,Plt 47,000
- Electrolyte : Na 132 , K 3.08 , Cl 100 , HCO3 15
- U/A : yellow , Sp.gr 1.025 , prot&sugar –ve , RBC - , WBC 0-1 ,sq.epithelium 0-1
- H/C, U/C : pending,
- CXR : alveolar infiltration both lung
- Melioid titer negative
- β hcg, AFP WNL



CXR:
Alveolar infiltration both lung

Problem list

- 1.Fever 4 days PTA
- 2.Tachypnea R/O severe pneumonia
- 3.Relapse germ cell tumor with pulmonary metastasis

Impression : febrile neutropenia with underlying relapse germ cell tumor with history pulmonary metastasis

Treatment

- In this patient
  - suspected source of infection was severe pneumonia
  - She was high risk
  - Empirical ATB she received were

- **Meropenem (60-100 mg/kg/day) 1 g IV drip q 8 hr**
- **Amikin(15 mg/kg/day) 150 mg IV drip q 8 hr**
- **Vancomicin (60mg/kg/day) 600 mg q drip q 8 hr**

- **Blood component: LPRC 300 ml IV drip in 3 hr**

Progression (day2)

- S : **agitation ,continued peak of fever**, **dyspnea**,

- O : v/s-T 38.7 to 39.5 ˚C , P 145, BP 100/70,RR 40

  PE: retaction both lung

ABG PH 7.25 PCO2 50 PO2 60 HCO3 16 BE -5

- A&P : Febrile neutropenia with impending respiratory failure

  <u>plan</u> – ET tube, cont ATB

Progression (day3)

- S : **agitation ,continued peak of fever**, **dyspnea**
- O : v/s-T 39 to 39.5 ˚C , P 100, BP 100/80,RR 36

  PE :crepitation both lung

F/U CBC – Hb 10 ,Hct 29.8 , WBC 700 , Plt 10,000 , PMN 8% (ANC 56) , L76%

E'ltyte – Na 136 ,K 3.4 , Cl 100.4 , HCO3 25.4

Lab : H/C no growth in 2 days, **CXR ARDS**

- A&P : Febrile neutropenia with ARDS

  -not improved

  plan - cont ATB , **add amphotericin B,**

  add bactrim,

  - LPPC 6 unit

Progression (day4)

- S : active, afebrile, no headache
- O : v/s-T 38.4 to 39.3 ˚C , P 95, BP 70/40,RR 60

- A&P : Febrile neutropenia with ARDS with septic shock

plan- IV resuscitation,inotropic drug

-----→ **Patient dead**

H/C no growth

ญาติปฏิเสธทำ **Autopsy**

Question

Thank you

- My patients
- My teacher
- My students
- All staff at suppasittiprasong hospital
- https://youtu.be/8eeVSIRwR4c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