Critical Care Case Review

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Disclosures

- None

Objectives

- Review Critical Care Case
- Recognize and treat urgent needs in the ICU
- Review pathophysiology, how to diagnosis and treatment plan

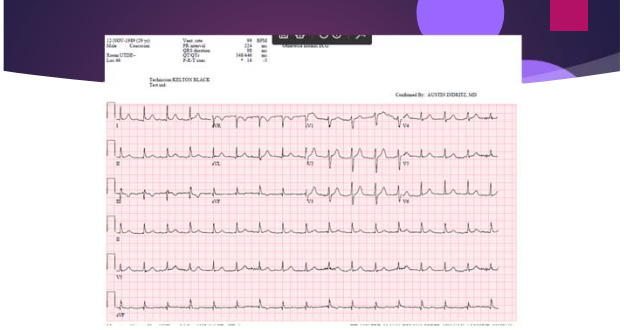
- 29 year old male with no PMHX presented to the Emergency Room by EMS with back pain after falling out of a recliner.
- Social Hx: He is a mechanic and has been taking ibuprofen for his back pain.
- Vitals signs on presentation to the ER: BP 120 systolic, HR 130, O2 SATS 93%, No RR or temp documented
- Report was taken by ED RN and was then placed on triage.

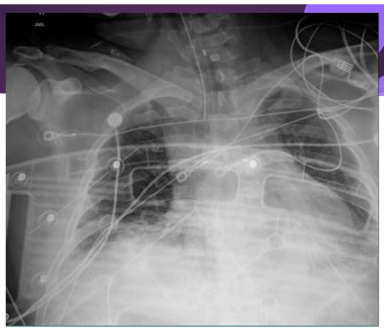
30 minutes after being in triage he was called for evaluation. While getting his vital signs checked he abruptly became unresponsive with agonal respirations. He had no palpable pulse. CPR was started immediately and he was wheeled back to the stab room.

Prolong resuscitation with ROSC after 27 minutes

Initial Labs showed

- lstat: 6.99/68/18 – No PO2
  - Repeat ABG: 7.22/26/61/11
- CMP: Na 118, Cl 79, AG: unable to calculate, CO2: < 10, Glucose 1187, Ca 8.1, Crea 5.2, k 5.5, alt 128, ast 364, tbili 0.3
- CBC: WBC 22.1, Hgb 16.9, plt 234
- INR 1.9
- Troponin: 0.097





Differential Diagnosis

- Myocardial Infarction
- Dehydration
- Ingestion, overdose
- Medication
- New Diabetic, DKA
- Infection / Sepsis
- Pulmonary embolism
- Rhabdomyolysis

ER Treatment

- IV Fluids
- DKA Protocol
- Hyperkalemia treatment
- Vasopressors
- Urgent consult to Nephrology

The Clock struck 12

Labs

- ABG: 7.29/45/97/22
- BMP: Na 128, CO2 17, K: 4.9, AG 18, glucose 456, Ca 6.6 (ionized 0.66)
- CBC: WBC 9.6, hgb 16.8, plt 102
- Lactate 2.9
- Mg: 1.7
- Triglycerides: 3382 → 2341 → 439
- Lipase: 840 → 640 → 218
- INR 1.6

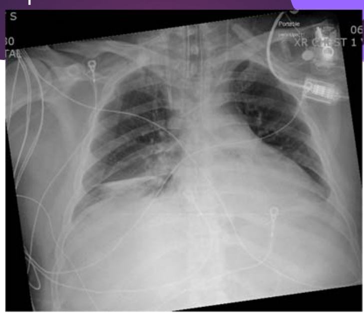
Day # 2

- Escalation of vasopressors
- oliguria, azotemia, difficult to ventilate with Peek pressures 40's
- Exam: Distended tight abdomen
- Bladder Pressure: 23-25
- CT abd: concern for necrotizing pancreatitis
- Broad spectrum abx and Vit. C protocol
- General Surgery consulted

OR – Exploratory Laparotomy

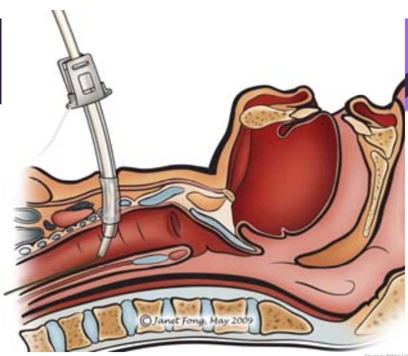
Source: Open Abdomen | Open Abdomen Management ...middleeast.kci-medical.com

CXR Post operative



Complications

- Plasmapheresis for hypertriglyceridemia
- Develop Upper and lower extremity DVT's, anticoagulation (Heparin) was started and later changed to argatroban for concern for HIT
- Developed concern for intra-abdominal bleeding with hematoma under Ab Thera wound vac dressing, treated for hemorrhagic shock with massive transfusion protocol
- Returned to the OR for exploration, placement of IVC filter
- Concern for neurological injury: MRI concerned for anoxic brain injury, EEG unremarkable for seizure



Source: https://openbooks.uct.ac.za/uct/catalog/view/ENTatlas/2/133-1

Day # 15-20

- Developed Perihepatic fluid collection: aspirated
- Exam: More abdominal distention and pain : NG placed
- Abdominal US: gallbladder distended and wall thickening with sludge (acalculous cholecystitis) – Percutaneous chole tube placed

Recap

- 29 year old male who present for back pain who had a cardiac arrest in the ED. ROSC after 27 minutes. Initially treated for DKA but then found to have pancreatitis due to hypertriglyceridemia and undiagnosed diabetes
- Day #2 he underwent exploratory laparotomy with abdominal decompression for abdominal compartment syndrome
- He was treated for DVT's but complicated by hemorrhage and returned to the OR for ex lap
- Underwent percutaneous tracheostomy placement, aspiration of fluid collection and percutaneous cholecystostomy tube placement

Discharged on Day # 23 to Bethesda

- Complicated by c-diff
- Decannulated on Day # 20
- Tolerating oral intake: NG tube removed Day # 29
- Courage Kenny
  - Dad is his full time care giver at this time
  - Severe cognitive/physical impairments
  - Needed 24 hour supervision and physical assistance. Adaptive equipment
  - Transfer from wheelchair
  - Communication limited with soft expression intermittently, written expression fairly legibility

Abdominal Compartment Syndrome

What is Abdominal Compartment Syndrome

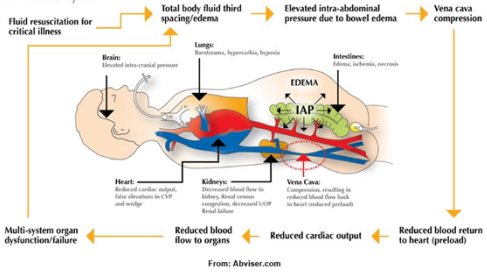
Sustained elevation of IAP of greater than 20 mmHg with new organ dysfunction

Primary
- Severe pancreatitis
- Trauma
- Abdominal surgery
- Ascites
- Retroperitoneal or Intraperitoneal hemorrhage
- Severe ileus or Obstruction

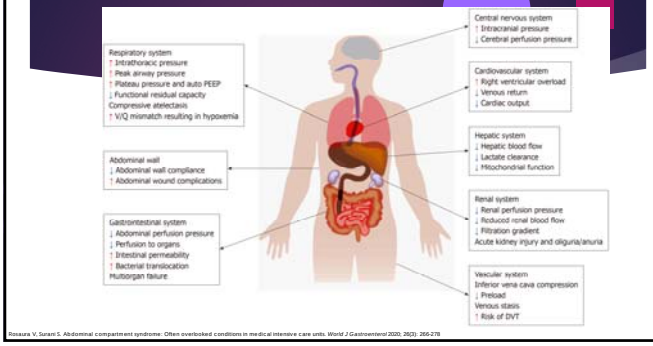
Secondary
- Major Burns
- Septic shock
- Hemorrhagic Shock with excessive crystalloid resuscitation

What Happens to the Body's Organs?

A Vicious Cycle



From: Abviser.com



Rosaura V, Surani S. Abdominal compartment syndrome: Often overlooked conditions in medical intensive care units. *World J Gastrointest* 2020; 26(3): 266-278

How to diagnosis it?

High index of Suspicion

Physical Exam: 80% specific

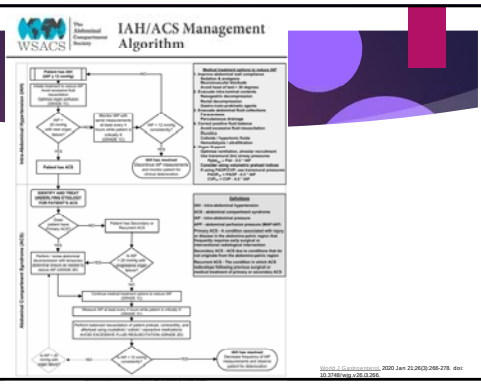
Bladder Pressure: **Sustained IAP greater than 20 mmHg**

- Patient must be supine and passive (not coughing or bucking ventilator)
- Measured at end-expiration
- May be inaccurate in the context of pelvic pathology (hematoma directly compressing the bladder)

Organ Failure: Difficult

TREATMENT

- Hemodynamics
- Volume Removal
- Decompress the Abdomen
  - NG/OG tube, paracentesis
- Decompress the Thorax
  - Reduction of Peep and plateau pressure
  - Drain pleural effusions
- BEWARE: Intubation may lead to poly-compartment syndrome
- Sedation & Paralysis
- Surgical Decompression



World J Gastroenterol. 2020 Jan 21;26(3):266-278. doi: 10.3748/wjg.v26.i3.266.

Pitfalls

- Mindset only treatment option is laparotomy
- Failure to consider abdominal compartment syndrome
- Over interpretation of bladder pressures
- ACS compresses IVC, making it look empty. This leads to erroneous decisions regarding fluid administration
- Avoid Intubation of patients with borderline ACS if possible

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