

Third Space Fluid Displacement

Key p. 34-37
Cline, Ma p. 212-218
(6th ed) p. 379-382
Ma, Cline p. 192-195 ; 289
(6th ed) p. 340-343

Objectives

Upon completing this lecture, you will be able to:

- Define third spacing
- Discuss third spacing
 - Pathophysiology
 - Causes
 - Consequences
 - Prehospital treatment

Third Spacing

- Occurs when an abnormal amount of fluid shifts into the interstitial space or peritoneal cavity and then remains there
 - e.g., lower extremity edema
- Third spaced fluid does **not** circulate to provide nutrients to cells

Consequences

- The collection of fluid in the interstitial space
 - fluid is then no longer “available” to the cellular and intravascular spaces
- Shock may occur

Pathophysiology

- Volume overload - Increased filtration
- Delayed / obstructed venous return - Decreased reabsorption
- Low osmotic pull - low serum protein (burns)
- Massive inflammation - Increased leakage

Pathophysiology

One type of third spacing: inflammation

- Inflammation
 - Infiltration of mast cells, eosinophils, basophils, and lymphocytes
 - Vascular leakage (permeability)
 - edema

Causes of Third Spacing

- Burns (capillaries increase permeability)
- Severe inflammation and tissue damage
- Increased hydrostatic pressure from heart disease or corticosteroid therapy
- Decreased colloid pressure from protein deficit caused by cirrhosis malnutrition or renal disease
- Acute pancreatitis
- Anaphylaxis

Clinical Settings

Pancreatitis [FYI]

- Traumatic : collection of peritoneal fluids
- Intraabdominal causes
 - perforation of a duodenal ulcer
- Metabolic hypertriglyceridemia
- Drugs (acetaminophen, and others)
- Infectious causes : viruses (mumps)

Clinical Manifestations

- Peripheral edema :
 - Takes 24-48 hr for fluid to leave blood vessels and accumulate in an injured lower extremity
- Generalized edema
 - Takes seconds to minutes for anaphylactoid reaction to fill tissue space with fluid

Symptoms of Third Spacing

- Abdominal swelling
- Volume overload symptoms
 - Dyspnea
 - Other CHF symptoms

Localized Signs of Third Spacing

- Abdominal swelling
 - ascites in cirrhosis
- Bullae in burns
- Facial edema

Generalized Signs

- Vital signs
 - Decreased BP
 - Increased HR
- Weight gain

Generalized Signs

- Abdomen (ileus)
 - Distension
 - Altered bowel sounds
- Extremities

Generalized Symptoms

- CHF Sx.
- Weight gain
- Confusion
- Incoordination
- Convulsions

Management

- Treat the underlining causes
- Treat shock
 - In pancreatitis, patient may need up to 6-8 liters of fluid per day
- 3-5 days fluid shifts back into vascular space (phase 2 fluid correction ratio: 1:3 intake : output) [FYI]

Summary

We have discussed :

- The definition, pathophysiology, and types of presentations of third spacing
- Discuss third spacing consequences
- Discussed limited prehospital interventions
