



Clinical Champion Update

Date: 7/25/22

Subject: Congestive Heart Failure

Peripheral edema and heart failure

Lower extremity edema is a common complaint in family practice and has a variety of different possible etiologies. This post is aimed at providing clarity about similarities and differences in diagnosis and treatment with a focus on peripheral edema associated with heart failure.

Types of edema

Generalized edema locates preferentially in dependent areas. In family practice, our patients are usually ambulatory so we mostly encounter edema in the lower extremities. Types:

- Pitting: most edema including that due to heart failure, cirrhosis, and venous insufficiency
- Non-pitting: less common, usually only due to hypothyroidism (myxedema) or lymphatic obstruction (lymphedema)
- Unilateral edema: DDX of DVT, chronic venous disease, lymphedema, or chronic regional pain syndrome.
- Bilateral edema:
 - Acute bilateral edema: DDX of acute HF, reaction to meds (e.g. dihydropyridine CCBs), acute nephrotic syndrome, bilateral DVT (often associated with malignancy)
 - Chronic bilateral edema is particularly common in elders:
 - Chronic venous disease is most common cause, but tends to be overdiagnosed.
 - Heart failure: next most common, tends to be underdiagnosed.
 - Pulmonary hypertension is the most commonly missed cause of bilateral edema.
 - Other causes: venodilating medications, cirrhosis, the nephrotic syndrome, others.

How can causes of edema be distinguished from one another?

Often, clinically:

- Heart failure: often there is a known history of HF. Ask about dyspnea, orthopnea, paroxysmal nocturnal dyspnea, fatigue, anorexia, abdominal distention. The most specific exam findings for HF are extra heart sounds, hepatomegaly, cardiomegaly, lung rales, and elevated jugular venous pressure.
- Pulmonary hypertension: may be caused by sleep apnea (ask about daytime sleepiness / apneas etc.) or chronic lung disease.
- Chronic venous disease: typical skin findings such as pigmentary changes, induration, and ulceration.
- Cirrhosis: jaundice, pruritus, other typical exam findings.
- Advanced renal disease: Most easily identified with renal function labs.
- If initial history and exam do not point towards one of these diagnoses, check urine protein (random), Cr, PT/INR, HFP, TSH. If these are unremarkable, do echocardiogram.

Management

Loop diuretics are generally not helpful in lymphedema or myxedema, but otherwise they can be used to reduce edema in any generalized edematous state. However, cautions are in order:

- Except in setting of edema caused by renal failure, retention of sodium and water by the kidneys is compensatory, meaning that it raises the effective arterial blood volume toward normal.
 - So removal of this fluid with diuretics sets in motion a chain of events that often results in decreased tissue perfusion.
 - Most patients still benefit from diuretics, even when cardiac output falls by 20 percent or more, with relief of fatigue and bloating.
 - Patients who do have significantly impaired tissue perfusion from diuretic therapy usually have cirrhosis or severe heart failure.
 - Monitoring:
 - Adequacy of tissue perfusion during diuretic therapy can be estimated with BUN / creatinine. If stable, then diuretic therapy has not led to a significant impairment in perfusion to the kidney or therefore to other organs.
 - Also monitor electrolytes due to possible hypokalemia with loop diuretics.
 - If significant unexplained elevations in BUN and Cr, avoid further fluid removal.
- Salt reduction, compression, and leg elevation are often as effective as loop diuretics and are unlikely to cause hypovolemia.

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