placebo-controlled trial demonstrated statistically significant but modest FVC improvement with oral cyclophosphamide at 1 year. However, after an additional year off therapy, cyclophosphamide-treated patients lost their benefit, suggesting that other treatment options are needed.

Case series with and without historical controls support the potential benefit of mycophenolate mofetil, and this drug is the subject of an ongoing randomized controlled trial. Lung transplantation can be considered for end-stage ILD.

Pulmonary Hypertension

Several agents have been approved for the treatment of PAH (see Chapter 18). Subset analyses of several placebo-controlled drug trials have shown improvement in established SSc or connective tissue disease–related PAH. They have included phosphodiesterase-5 inhibitors (e.g., sildenafil, tadalafil), endothelial receptor antagonists (e.g., bosentan, ambrisentan), and prostacyclin analogues (e.g., treprostinil, epoprostenol) (level A evidence).

Theoretically, treatment of patients with early, less severe disease should improve outcomes, but studies are only beginning to be reported. Because patients with SSc-related PAH have a worse prognosis than those with idiopathic PAH, SSc patients with PAH should be recommended to a tertiary care facility with a dedicated pulmonary hypertension clinic.

Cardiac Manifestations

Combined corticosteroids and immunosuppression can be used for myocarditis. Conventional treatment is recommended for symptomatic pericarditis (see Chapter 10), arrhythmias (see Chapter 9), and congestive heart failure (see Chapter 5).

Gastrointestinal Manifestations

Gastroesophageal reflux, which occurs in most SSc patients, can be treated with proton pump inhibitors and conservative measures, including elevation of the head of the bed and avoidance of alcohol and caffeine. If untreated, reflux esophagitis can progress to distal esophageal stricture formation.

Patients with severe esophageal, gastric, or small bowel dysmotility may improve with the use of prokinetic drugs such as metoclopramide, erythromycin, or octreotide. Rotating antibiotics may be of assistance for bacterial overgrowth. For advanced small bowel involvement with malabsorption, supplementation of iron, calcium, and fat-soluble vitamins may be required. Occasionally, total parental nutrition is necessary. Unexplained iron-deficiency anemia in SSc patients suggests the possibility of gastric antral vascular ectasias (i.e., watermelon stomach), which are treated with laser photocoagulation.

Skeletal Muscle, Joint, and Tendon Manifestations

Bland myopathy usually is nonprogressive and is treated with physical therapy. If there is evidence of myositis with elevated serum levels of muscle enzymes or abnormal electromyography or muscle biopsy, corticosteroids and immunosuppressive therapy (e.g., methotrexate, azathioprine) may be helpful.

Patients with lcSSc or dcSSc can develop contractures of the hands due to tendon involvement. Physical therapy with daily stretching exercises directed at the finger joints should be instituted as soon as possible to prevent further loss of finger motion.

For a deeper discussion of these topics, please see Chapter 267, "Systemic Sclerosis (Scleroderma)," in Goldman-Cecil Medicine, *25th Edition.*

SUGGESTED READINGS

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