Pernio (Chilblains)

Pernio (perniones), or chilblains, are localized, inflammatory, bluish red lesions caused by an abnormal reaction to a cold, damp environment. This mild form of cold injury is prevalent in the temperate climates of northwestern Europe, and it is found worldwide throughout temperate and northern zones. Pernio is less common in very cold climates where well-heated houses and adequate warm clothing are common.

In a study of 111 patients, 67 (60.4%) were males and 44 (39.6%) were females. Eighty-nine (80.2%), 90 (81.1%), and 90 (81.1%) patients had onset in relation to lower temperature (<10°C [50°F]), relatively low atmospheric pressure (<1500 kPa), and higher relative humidity (>60%), respectively. Susceptibility to chilblains appeared to increase when ambient temperature was less than 10°C (50°F) and relative humidity more than 60%.

Acute pernio has a seasonal incidence, with reversible symptoms more common in cold weather. The acute form is seen primarily in schoolchildren and young adults under the age of 20 years, with the highest incidence in adolescent females. It can occur in mildly cold settings such as logging, kayaking, snowmaking, winter horseback riding, and hiking. Pernio can be caused by brief (30 minutes) cold exposure, often appearing several hours after exposure, with the skin lesions fully developed within 12 to 24 hours. Characteristic locations for these lesions are the feet, hands, legs, and thighs. Single or multiple, erythematous, purplish, edematous lesions form, with vesicles in severe cases. Symptoms include intense pruritus, burning, or pain, often worsened by subsequent warmth. The lesions of acute pernio are self-limited and usually resolve within a few days to 3 weeks, occasionally leaving residual hyperpigmentation. Although the healing process appears to occur as the plaques resolve, pain often persists. Subsequent mild cold exposure may trigger paresthesias, edema, and skin scaling.

Chronic perniosis usually progresses over several winters after repeated episodes of acute pernio, rarely progressing from the initial injury to chronic irreversible skin changes within a single season. Repeated episodic seasonal lesions may become edematous, with permanent discoloration and subcutaneous nodule formation. The nodules are firm and painful, ultimately rupturing, which provides pain relief and leaves a shallow ulcer with pigmented atrophic skin. These ulcers may grow larger and coalesce, remaining open, which leads to permanently swollen extremities, scaly pigmented skin, and unremitting pain aggravated by light pressure.

Pernio is believed to be caused by prolonged cold-induced vasoconstriction with subsequent hypoxemia and vessel wall inflammation. Subcutaneous arterial vasoconstriction is documented by both pathologic and arteriographic studies. Histologic examinations show a lymphocytic vasculitis and papillary dermal edema with pervasive inflammatory changes. The differential diagnosis includes lupus erythematosus, Raynaud’s disease, polycythemia vera, atheromatous embolization, erythema nodosum, and livedo vasculitis with ulcerations.

Treatment of pernio is accomplished by drying and gently massaging the affected skin. Active warming above 30°C (86°F) significantly worsens the pain and should be avoided. Although therapeutic regimens in the literature include nicotinic acid, ultraviolet irradiation, thymoxamine, intravenous calcium combined with intramuscular vitamin K, corticosteroids, and sympathectomy in severe cases, few have proved to be either effective or universally accepted. Recently, nifedipine (20 mg, 3 times daily) has been shown to be effective for treatment of severe perniosis. Patients treated had a significantly reduced time for clearance of lesions, decreased pain and irritation of existing lesions, and less development of new pernio.

Preventing pernio is relatively simple. Recommended prophylactic measures include minimizing cold exposure with suitable clothing when outdoors and maintaining adequate warm temperatures indoors.