Pincer nail deformity associated with an arteriovenous fistula for hemodialysis

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Case report

A 51-year-old female piano teacher presented with a 3-month history of progressive deformity of the nails of the right hand, associated with painful erythematous swelling of the lateral nail folds. Her medical history was significant for hypertension, hyperlipidemia, diabetes mellitus and end-stage renal disease. She had been undergoing hemodialysis for the past 8 years. She was taking nifedipine, valsartan, doxazosin and fluvastatin. The patient noticed progressive thickening and increased transverse curvature of multiple nail plates, which started with the right thumb and index finger (Figure 1). The distal nail rounded up and pinched deeply into the nail bed and lateral nail folds, resulting in paronychia with painful swelling, hemorrhage and pus discharge (Figure 2). Pus culture grew abundant Staphylococcus aureus. Her right hand also appeared swollen and congested, and the affected nails displayed leukonychia. The distal nail plate was sent for pathologic examination, which revealed subungual hyperkeratosis with parakeratosis and focal plasma globules. No fungi were identified by periodic acid-Schiff stain. The arteriovenous fistula (AVF) in the right arm and forearm was markedly engorged with strong pulsation and thrill. An X-ray of the hands revealed no obvious bony hypertrophy. The patient was advised to elevate her right arm to reduce venous hypertension. Pain and paronychia improved after symptomatic treatment with a short course of antibiotics and prednisolone (20 mg/day). Evaluation by a cardiovascular surgeon regarding possible revision of vascular shunt was suggested to the patient, but she opted to continue with supportive treatment.
Discussion

Nail abnormalities have been reported in 60–76% of patients undergoing hemodialysis.\textsuperscript{1,2} The abnormalities include half-and-half nails, absence of lunula, onycholysis, brittle nails, Beau’s lines, clubbing, and longitudinal ridging in descending order of frequency. Pincer nail, a deformity characterized by transverse overcurvature that progressively pinches the nail bed distally, has also been reported in the setting of hemodialysis. We are aware of three single case reports of pincer nail as a complication of iatrogenic AVF\textsuperscript{3–5} and two cases in a series of 100 patients.\textsuperscript{2}

Pincer nail usually occurs in the great toes, but fingers may also occasionally be affected. In the severe form, the nail deformity may resemble trumpet or animal claw.\textsuperscript{6} In the review by Baran et al,\textsuperscript{7} pincer nail involving the big toes was suggested to be closely related to ill-fitting shoes, but it has also been associated with other conditions, including hereditary predisposition, psoriasis, tumor of the nail apparatus, exostoses, implantation cyst, myxoid pseudocyst, tinea unguium due to \textit{Trichophyton rubrum}, metastatic colon adenocarcinoma, after AVF placement, and β-blocker treatment.\textsuperscript{8}

In the report by Greiner et al,\textsuperscript{8} the deformity involved multiple fingernails and toenails, but resolved after discontinuation of acebutolol. Our patient was taking nifedipine, valsartan, doxazosin and fluvastatin; however, there is no reported association between these medications and pincer nail. Baran et al\textsuperscript{7} suggested that pain and inflammation were the major indications for the treatment of pincer nail. Mild cases may be treated with conservative measures, including clipping (after emollient occlusion or foot bath), grooving, thinning and orthonyx, which involves mechanical correction by applying tension to the transverse nail curvature. Conservative treatments may relieve the symptoms temporarily, with easy recurrence. In addition, some surgical management have been proposed that focus on the removal of the lateral osteophytes or the matrix horns, with variable results.\textsuperscript{7}

The pincer nail deformity in our patient involved multiple digits, and it would therefore be preferable to treat the underlying process, such as by revision of the arteriovenous shunt, instead of treating the individual nails.

The pincer nail affected all five digits distal to the AVF in the right forearm in our patient. The deformity was associated with painful paronychia and venous hypertension of the right hand. Of the five reported cases of pincer nail associated with AVF,\textsuperscript{2–5} three also had changes of pseudo-Kaposi’s sarcoma, manifesting as edema, hyperpigmentation, and purple maculopapules or plaques.\textsuperscript{3–5} As the deformity was limited to the part of the hand with the pseudo-Kaposi’s sarcoma, the deformity may be causally related to venous hypertension and local progressive vascular proliferation,\textsuperscript{3} and should thus be recognized as a specific sign of circulatory disturbance caused by the AVF.\textsuperscript{7}

In the patient reported by Hwang et al,\textsuperscript{3} initial treatment of pincer nail by grinding of the nail plate and nail extraction was ineffective, but both nail deformity and pseudo-Kaposi’s sarcoma gradually resolved after fistula ligation. The pincer nail in our patient was severe and painful. In such cases, revision of the arteriovenous shunt may be necessary if the symptoms cannot be relieved by supportive treatments.

References