Subcutaneous Emphysema Induced by Intralesional Cryotherapy

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Dear Editor,

Subcutaneous emphysema (SE) is a rare complication characterized by the accumulation of air within the subcutaneous tissue.[1] It is most commonly associated with visceral trauma and infections.[2] However, it may also occur rarely following dermatologic procedures, particularly after hydrogen peroxide irrigation, punch biopsies, or cryotherapy.[3] In this letter, we present a case of extensive SE that developed after intralesional cryotherapy (ILC) to treat an auricular keloid and subsequently spread into deep fascial planes.

A 35-year-old otherwise healthy woman presented with a 1-cm nodular lesion on the posterior aspect of the right lobulus auriculae that developed two years after an ear-piercing procedure (Figure 1a). The histopathological findings were consistent with keloid. The patient had undergone surgical excision and intralesional steroid injections. Because of recurrence, combination therapy consisting of ILC followed by intralesional steroid injection was initiated. During the third session, intralesional steroid was first administered, followed by ILC using an open-ended needle attached to a metallic cryoprobe shaft. Before the procedure, a needle was inserted through the nodule, with its tip left protruding externally; however, following cryotherapy, the needle was removed from the lesion before the device was disconnected.

Five minutes after the procedure, the patient developed marked facial edema, uvular deviation to the right, dyspnea, and crepitus on palpation of the mandibular and postauricular regions (Figure 1b). Computed tomography of the maxilla and thorax revealed widespread SE extending from the postauricular region to the supraclavicular region and radiating into the parapharyngeal, submandibular, and mediastinal spaces (Figure 2). The patient was followed up, and the emphysema regressed spontaneously within 3-5 days. However, exertional symptoms persisted for 1-2 months before complete resolution.

While SE has occasionally been reported after spray or contact cryotherapy, its development following ILC remains exceedingly rare, with only a few cases documented in the literature.[1-3] In our case, the presence of multiple prior ILCs, the use of an open-ended needle, or the possibility that the needle tip had shifted toward the lesion during the procedure may have created a pathway allowing nitrogen gas to leak into the subcutaneous tissue. Previous reports have also emphasized that disruptions in skin integrity may serve as one-way valves for pressurized gas, facilitating the development of SE.[2,3]

The case reported by Falay Gür et al.[1] was the first to describe SE following ILC, with the complication attributed to the use of an open-ended needle and the lack of a safety system. Martínez-Coronado et al.[3] reported that spray cryotherapy, when applied after intralesional injections, increased the risk of SE, particularly in elderly patients, in those with damaged skin barriers or atrophic skin, or in areas with a thin dermis. In such settings, the use of a cotton-tipped applicator is recommended to minimize the risk.[2,3]

Specialized cryoprobe systems, such as CryoShape, which are designed with a closed distal tip and a double-lumen structure, may reduce tissue trauma and prevent gas leakage. In contrast, open-ended needle systems may increase the risk of SE, particularly when a needle is connected to the cryotherapy device before insertion into the lesion or disconnected only after needle removal.[1] In most cases of SE reported in

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Figure 1. (a) Nodular lesion located on the posterior aspect of the auricle before the procedure; (b) post-procedural edema observed in the mandibular region

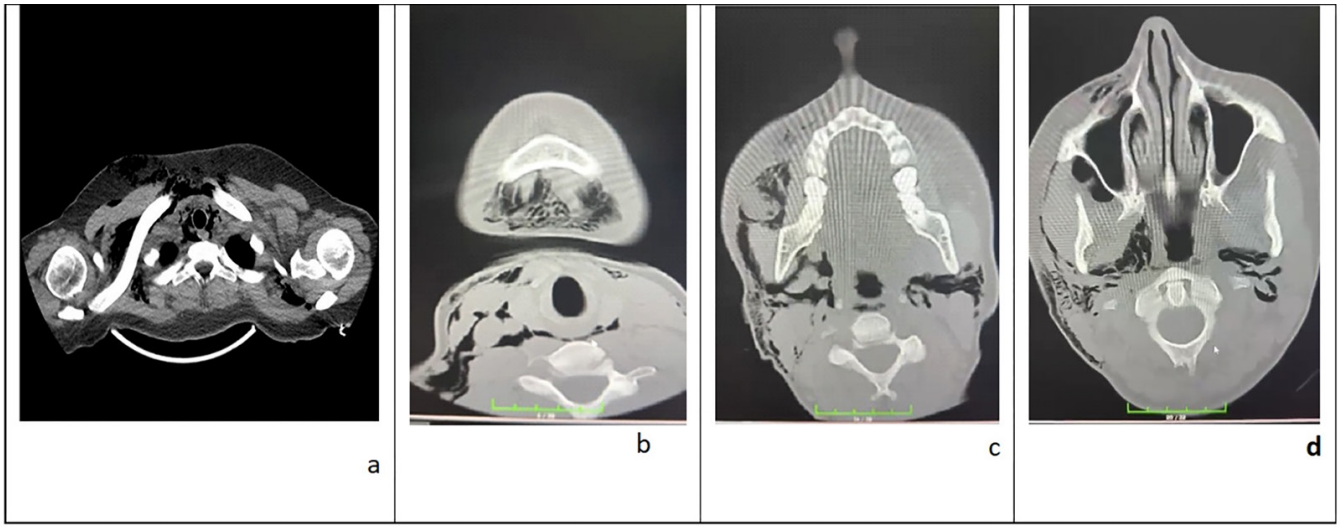

Figure 2. Computed tomography images showing (a,b) air densities extending from the mediastinal area into the subcutaneous tissues between the cervical muscle layers, including the retropharyngeal, submandibular, and sublingual spaces, as well as along the upper posterior and anterior thoracic walls and the posterior mediastinum; (c,d) subcutaneous emphysema more prominently involving the right side of the neck, extending into the bilateral parapharyngeal, masticator, and parotid spaces, the right temporal fossa, posterior cervical triangle, and nasopharyngeal spaces, surrounding the adjacent vascular structures

the literature, the condition resolved spontaneously with supportive care, and no additional treatment was required.[3,4] Similarly, in our patient, facial swelling and crepitus subsided rapidly. However, unlike previously reported cases, our patient-who was followed jointly with the thoracic surgery department-experienced exertional dyspnea that persisted for up to two months. We believe this prolonged symptom may have been related to the extensive spread of SE, including mediastinal involvement. The complaint also resolved spontaneously during the follow-up period.

This case underscores the importance of appropriate technique and equipment selection during ILC. To minimize the risk of SE, clinicians should prefer closed-system cryoprobes, avoid open-ended needles, and exercise particular caution in anatomically vulnerable areas or in previously treated lesions.

Ethics

Informed Consent: Written informed consent was obtained from the patient for publication of clinical details and images.

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