

IMPLANTATION DERMATOSES

Amir H. Mehregan and B. Faghri

*From the Department of Dermatology, Wayne State University School of Medicine,
Detroit, Michigan, USA*

Abstract. A clinico-pathologic study is made of 35 consecutive cases of implantation dermatosis diagnosed in a dermatopathology laboratory. Silica crystals were found responsible for the cutaneous eruption in 16 instances. Other foreign material penetrated into the skin included lead pencil, wood and plant material, silver particles, fishbone, glass, BB pellets and latex paint.

A variety of foreign material may accidentally penetrate into the skin. The morphology of the skin lesions produced depends upon the type of material and size of the particles penetrated. When the history of an injury is taken, the possibility of a foreign-induced lesion may be considered. If such history is lacking, diagnosis may depend on the histologic findings. To become aware of the variety of material that may accidentally penetrate into the skin and in order to recognize these in histologic preparations, we have reviewed thirty-five consecutive cases from the file of a dermatopathology laboratory. Clinical data and histologic findings are presented, classified into the following categories:

1. *Silica granuloma*

Silica particles are the most common material that may penetrate into the skin within the injured areas. Sixteen cases reviewed in this between series consisted of 14 females and 2 males. Their ages ranged 12 and 57, and averaged 37 years. Duration of the lesions varied from 4 weeks to 14 years. Knees were the most common sites of the eruption and were involved in 7 instances. Involvement of arms and elbows was noted in 4 cases. Facial lesions were present in another 4 and the sole of foot was involved in 1 patient. In 9 instances there were solitary or multiple areas of thickening and nodularity of the skin inside or in close approximation to an area of

scarring. The remaining 7 patients showed involvement of knees with purplish papulo nodular eruptions that were clinically diagnosed as lichen planus, granuloma annulare or sarcoidosis. Histologic sections revealed extensive dermal infiltrate of epithelioid cell lobules, large macrophages and multinucleate giant cells containing silica particles of varying size. Silica crystals in the tissue sections were best demonstrated under polarized light (Fig. 1).

2. *Lead pencil tattoo*

There were 5 instances of solitary skin lesions secondary to accidental penetration of a pencil tip into the skin. The patients were in their second to fourth decades of life. Sites of the lesions included ankle, upper back, forehead, cheek and finger. The lesions consisted of a 2 to 3 mm macular spot of deep blue or black pigmentation. Positive history of injury with pencil tip was given in all 5 instances. Histologic sections demonstrated deposition of black particles of various size, free or within macrophages in the upper or mid dermis.

3. *Wood and plant material*

Particles of wood or plant material were found embedded in the skin in 5 instances. These were individuals in their first and second decades of life. Duration of the lesion varied from 2 weeks to 1 year. The lesion appeared as a solitary intra-cutaneous nodule. Locations included thumb, thigh, back of hand, forearm and the scalp. Histologic sections from a lesion on the dorsum of hand of a 17-year-old girl revealed cross sections of a rose thorn surrounded by an abscess, areas of granulation tissue, and foreign body granuloma. A nodular lesion of scalp, clinically

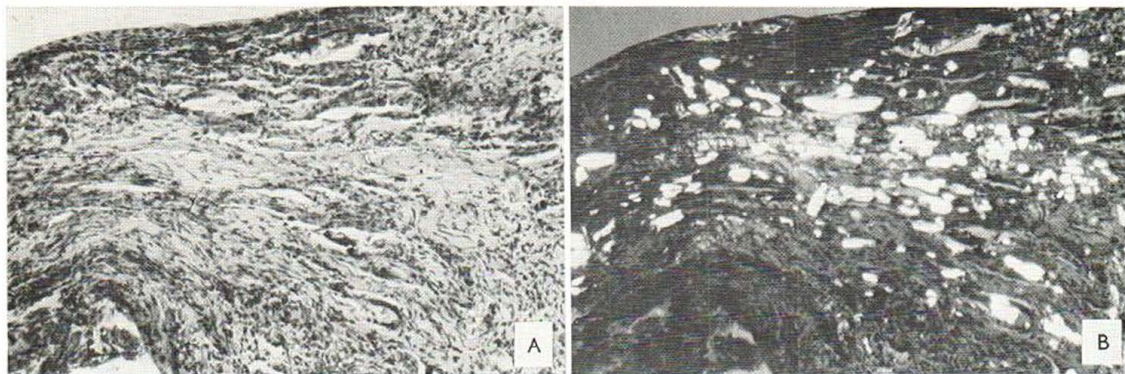


Fig. 1. (A) Shows silica granuloma with large number of macrophages and multinucleate giant cells containing cleft-like spaces. Hematoxylin-eosin, $\times 58$. (B) Same slide

photographed under polarized light shows double refractile silica crystals in macrophages and giant cells.

diagnosed as pilomatricoma, showed a solid piece of charcoal embedded in fibrous tissue in the corium. In the remaining 3 instances, a piece of wood splinter was found in the tissue sections surrounded by granulation tissue and foreign body granuloma. Like silica, wood particles are also best demonstrated under the polarized light (Fig. 2).

4. Silver tattoo

Five instances of silver tattoo occurred over the buccal mucosa and lip secondary to trauma during dental repair. The lesion consisted of a well defined macular area of black pigmentation resembling lentigo simplex or a junction nevus. In histologic sections fine dark-staining silver granules were found bound to the basement membrane

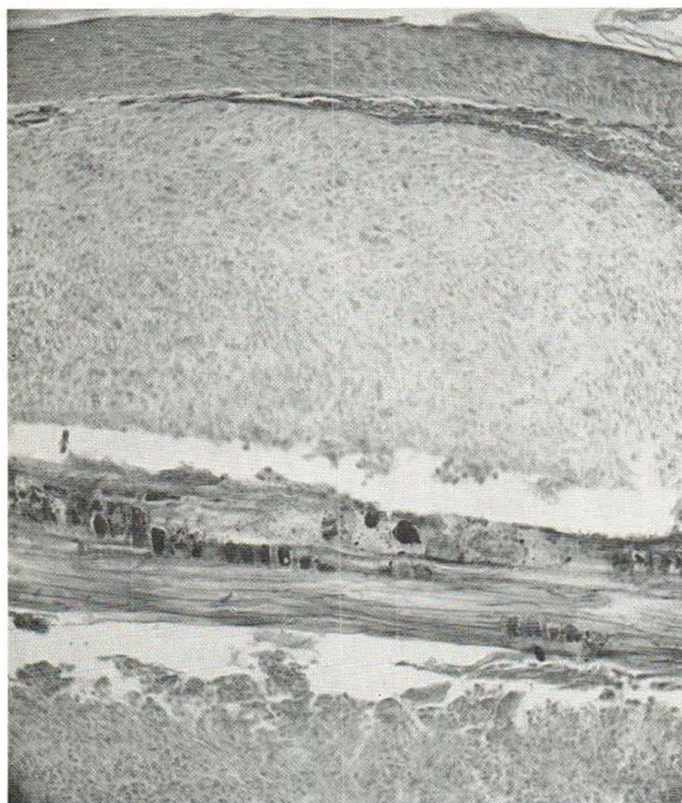


Fig. 2. A wood splinter surrounded by granulation tissue and foreign body granuloma. Acid orcein-Giemsa, $\times 120$.

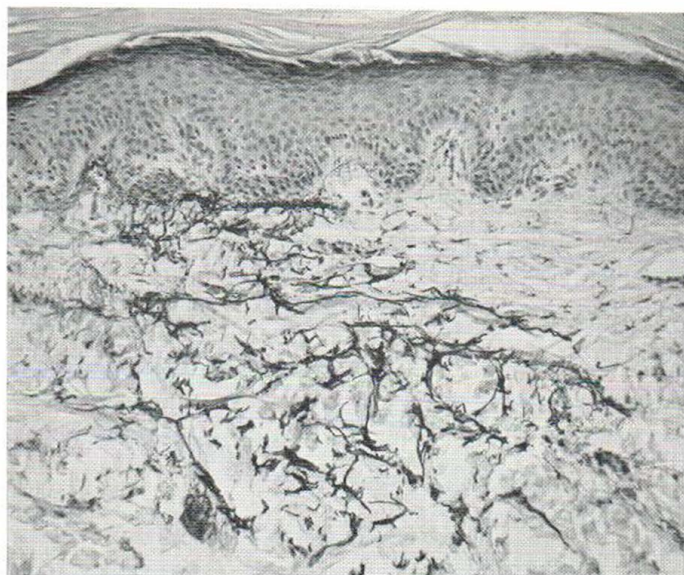


Fig. 3. Silver tattoo shows deposition of silver particles in basement membrane and over the dermal elastic fibers. Hematoxylin-eosin, $\times 130$.

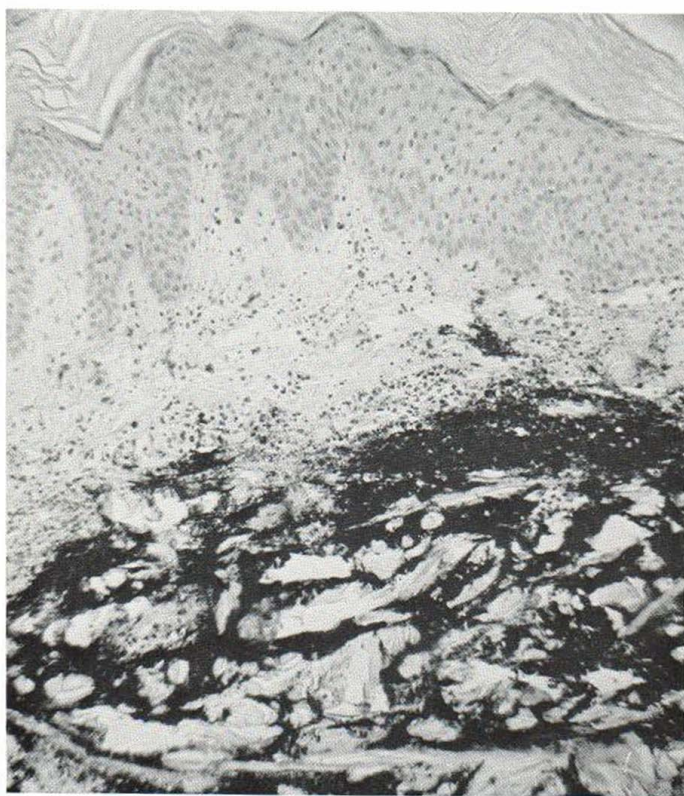


Fig. 4. Extensive deposition of latex paint in between dermal collagen bundles following the use of high power paint spray gun. Hematoxylin-eosin, $\times 120$.

and to the argyrophilic dermal connective tissue fibers (Fig. 3).

5. Miscellaneous group

This group included 4 cases. In one case, penetration of a fish bone into the center of forehead of a young girl produced a crusted granulomatous nodule diagnosed clinically as a fresh lesion of leishmaniasis. The fish bone extruded from the center of the lesion when the lesion was squeezed in order to prepare a Tzanck smear. In another case with multiple nodular lesions of deltoid area showed BB pellets penetrated into the skin in a biopsy specimen. In one case of single palmar lesion, a piece of glass was found extruding through the specimen while the excised tissue was being processed for histologic examination. In another case, particles of Latex paint penetrated into the skin of forearm accidentally through the application of a high power paint spray gun. Histologic sections in this case demonstrated particles of Latex paint penetrating the entire thickness of the corium and part of the subcutaneous fat tissue (Fig. 4).

COMMENTS

A variety of foreign substances may penetrate into the skin by accident. In the series reviewed, silica was the most common material found in old scars and areas easily subject to trauma. In 7 patients with lesions of knees, silica granu-

loma appeared as purplish papulo nodular eruptions that were diagnosed as lichen planus, granuloma annulare or sarcoidosis. Lead pencil, plant material and silver particles were found in the skin lesions in another 15 instances. Papulo nodular lesions of hands and arms have been described secondary to penetration of cactus spines (4). Penetration of dead hairs into the skin produces sinus-like lesions on the palms (barber's hair sinus and milker's hair sinus) and on the soles or between the toes (2, 3). Pigmented spots may occur secondary to lead, carbon particles, silver or other metallic substances (1).

REFERENCES

1. Allen, A. C.: *The Skin*, p. 619. C. V. Mosby Company, St. Louis, 1954.
2. Pilotto, P., Hunziker, N. & Orusco, M.: Le Trichogranulome interdigital du coiffeur. *Dermatologica* 141: 84, 1970.
3. Rook, A., Wilkinson, O. S. & Ebling, F. J. G.: *Textbook of Dermatology*, p. 327. Blackwell Scientific Publications, Oxford, 1968.
4. Winer, L. H. & Zeilenga, R. H.: Cactus granulomas of the skin. Report of a case. *Arch Dermatol* 72: 566, 1955.

Received April 9, 1973

A. H. Mehregan, M.D.
Pinkus Dermatopathology Laboratory
P.O. Box 360
Monroe, Michigan 48161
USA