The present report is one of few describing both the histopathological and dermoscopic findings of PP. Bolewska [7] and Mehta [8] have reported the dermoscopic features of PP patients at different stages, but did not observe many findings in common. Our observation suggests that the fully developed and late stages of PP are probably relevant to the dermoscopic pattern of a brown circle-shaped centre, surrounded by linear vessels with branches and perifollicular pigmentation; moreover, the early-stage dermoscopic pattern may be correlated with the superficial dotted vessels. Darier's disease, Dowling-Degos disease and confluent and reticulated papillomatosis may show similar clinical features with PP. On dermoscopy, Darier's disease shows a central star-shaped, branched polygonal or roundish-oval brownish area surrounded by a whitish halo. Dowling-Degos disease shows a brown star-like area or irregular brownish projections with a hypopigmented centre. Confluent and reticulated papillomatosis shows fine whitish scaling and brownish areas in a "cobblestone" or "sulci and gyri" pattern [9].In conclusion, we describe the dermoscopic features of PP in a patient presenting with characteristic linear vessels with clustered branches and scattered perifollicular pigmentation. While dermoscopy has a role in PP diagnosis, histological examination of PP remains necessary for diagnosis. ■

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Analysis of skin surface substances using scanning electron microscope energy-dispersive X-ray spectroscopy: a suspected case of pseudochromhidrosis

Chromhidrosis is a rare disorder wherein sweat is secreted with various possible pigmentations [1]. Intrinsic chromhidrosis occurs when the secreted sweat itself is coloured, which can be caused by foods, drugs, or water-soluble pigments [2-4]. Pseudochromhidrosis is a condition in which sweat becomes coloured due to chemicals, drugs, dyes, or pigment-producing bacteria [5, 6]. Although the coloured matter should be identified to understand the underlying aetiology of this disease, a comprehensive assessment is difficult to perform due to low sample volumes. We report the case of a patient with suspected pseudochromhidrosis in which information from scanning electron microscope energy-dispersive X-ray spectroscopy (SEM-EDS) analysis was useful in understanding the aetiology of the condition.

A 15-year-old boy with a chief complaint of his skin becoming spontaneously stained with various colours over the past six months visited our clinic. He had no underlying diseases except urticaria. During the first visit, his right cheek, neck, and forearm were stained with a reddish-pink colour (*figure 1A-C*). A paste-like substance with the same colouration was attached to the patient's skin and gums. Initially, it looked as if he had painted himself with the substance. The patient and his parents believed that the reddish-pink staining could be coming from his sweat. They wanted to understand the identity and origin of this colour. His physical condition was normal. A quantitative sudomotor axon reflex test (a sweat test that actively stimulates sweat by administering acetylcholine) and a passive sweat test, whereby sweat was induced by a sauna bath, did not reveal any abnormality in his sweating. Thus, the coloured matter on the skin and gingiva was wiped off with gauze and taken for further analysis using SEM-EDS. The colours of the mud-like samples brought for analysis were black, green, yellow, orange, and pink (*figure 1D-F*). Two were taken from the gingiva (*figure 1F*).

SEM images are obtained by scanning a surface of a sample with an electron beam and detecting the electrons emitted, transmitted, or reflected from the sample. EDS is a method of elemental analysis using X-rays emitted, based on the interaction of the electron beam with the sample. The technique was chosen as it can be applied to analyse low sample volumes. Analysing biological materials with SEM-EDS is challenging because tissue samples are often too fragile to be irradiated by electron beam. Nevertheless, SEM-EDS of the samples showed significant peaks for carbon, oxygen, and calcium (*figure 1G*), suggesting that these elements were the main constituents of the samples.

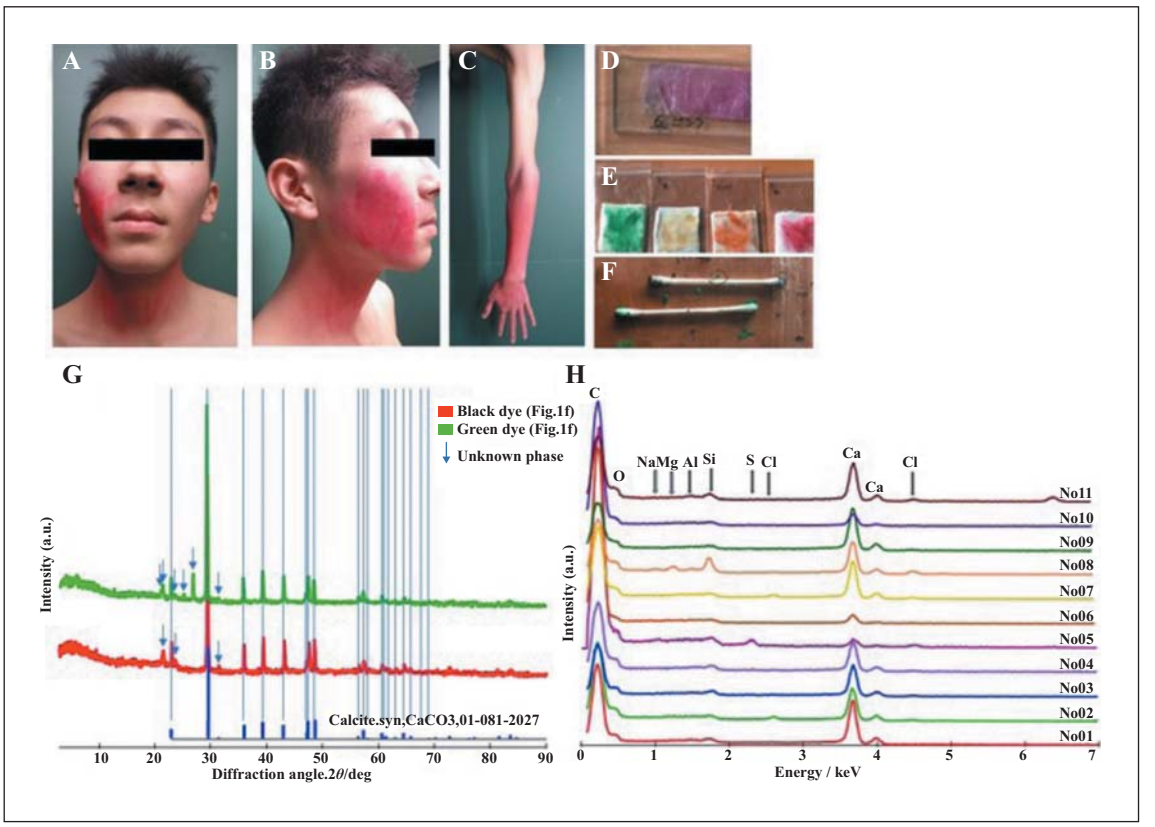

Figure 1. **A**-**C**) Clinical images taken at the first visit showing the reddish-pink dye on the patient's right cheek, neck and forearm. **D**) A reddish-pink dye collected by adhesive tape from his body at our hospital. **E**) Green, yellow, orange, and pink pigments collected by the patient's family. **F**) The dye attached to the gingiva collected with a cotton swab. **G**) The results of SEM analysis showed peaks in carbon, oxygen, and calcium. **H**) Crystal phase analysis revealed an X-ray diffraction profile consistent with calcium carbonate.

Additional crystal phase analysis revealed X-ray diffraction profiles consistent with calcium carbonate (*figure 1H*). The results of the SEM-EDS analysis suggested that the coloured material did not originate from body fluids or the skin tissue, indicating an external origin. Calcium carbonate is insoluble in water; it can dissolve at only 2×10^{-3} M at a pH of 7.1, a temperature of 25°C, and an atmospheric pressure of 1 atm [7]. Its solubility increases with stronger acidity, lower temperature, and higher pressure. Since the pH of the human body is around 7.35-7.45, it is difficult for calcium carbonate to dissolve in the human body where it is normally absent.

Thus, we believed that this patient was exposed to a coloured extrinsic substance that contains mainly calcium carbonate. However, he and his family could not confirm whether he had come in contact with different chemicals. Rather, the shape of the coloured lesions indicated that the colorant might have been artificially daubed onto his skin. Furthermore, the coloured substances on the gingiva were pasty (*figure 1F*). Therefore, we thought that this was a case of pseudochromhidrosis due to the colourant, like chalk, which was mainly made of calcium carbonate.

We explained the results of the SEM-EDS assessment to the patient and his parents. They wished to consult a child psychiatrist who diagnosed him with a suspected factitious disorder. Here, we objectively identified the cause of the abnormally coloured skin via SEM-EDS. Although the results of the SEM-EDS analysis alone may not suffice to make a medical diagnosis, they can provide useful information that helps to understand the aetiology of the condition.

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A case of orofacial swelling accompanied by sarcoid-like reaction due to chronic active Epstein-Barr virus infection

A 17-year-old man presented with an eight-month history of eyelid and lip swelling associated with diplopia and myalgia of the left leg. The eyelids and lips showed swelling with no discolouration, suggesting orofacial granulomatosis (OFG) (*figure 1A, B*). No facial nerve palsy or lingua plicata were found. Histopathological examination of the lower lip revealed oedema with partial myxedema around the orbicular muscle and nerves, accompanied by perivascular lymphocytic infiltration intermingled with histiocytic infiltration (*figure 1C*). These findings were compatible with OFG even though no granuloma was apparent [1]. Laboratory data revealed elevated serum levels of both angiotensin-converting enzyme (ACE) (36.5 U/L; normal range: 7.0-25.0 U/L) and lysozyme (12.2 μg/mL; normal range: 5.0-10.0 μg/mL). Serum levels of lactate dehydrogenase, creatinine phosphokinase, ferritin and soluble interleukin-2 receptor were 487 U/L (normal range: 124-222 U/L), 1,402 U/L (normal range: 59-248 U/L), 191.6 ng/mL (normal range: 50-200 ng/mL) and 626 U/mL (normal range: 192-530 U/mL), respectively. Haemoglobin level, neutrophil count and platelet count in peripheral blood were 15.5 g/dL, 1,560/μL and 146,000/μL, respectively. One month later, the patient revisited our hospital with a fever of 39.4°C. Contrast-enhanced magnetic resonance imaging (MRI) revealed intense signals in several muscles of the legs on fat-suppressed T2-weighted images. Further, ^{18}F-fluorodeoxyglucose (FDG) positron emission tomography demonstrated uptake of FDG in the muscles of both lower eyelids, the lips and crural muscles. A second skin biopsy from the upper lip showed a collection of histiocytes (*i.e.*, with an epithelioid granuloma-like structure) in and around skeletal muscle, in addition to the

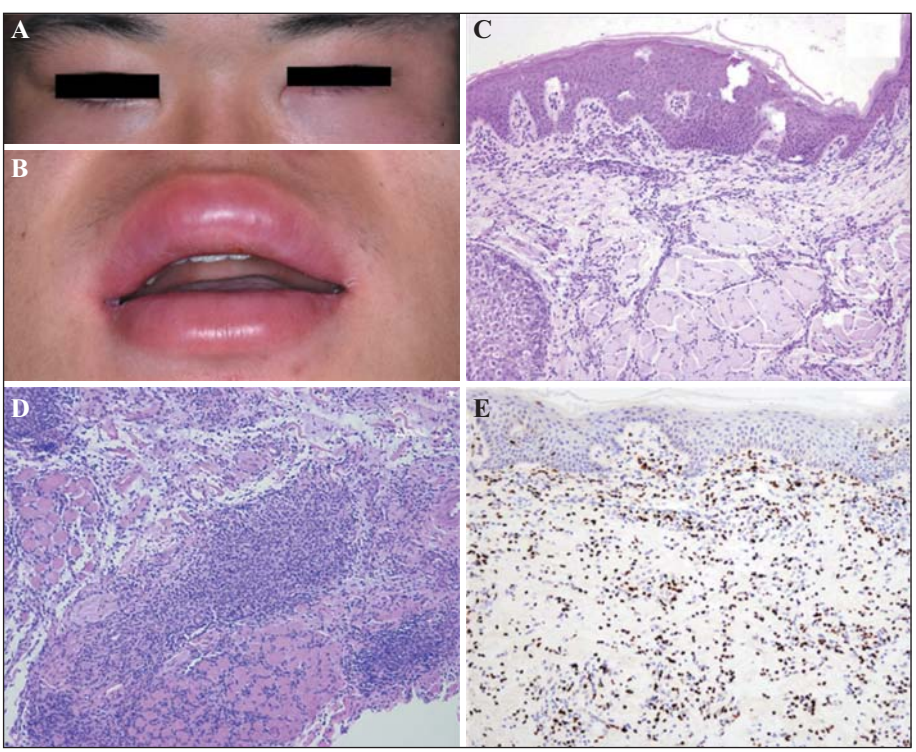

Figure 1. **A**, **B**) The eyelids, in particular the lower left eyelid (**A**) and lips (**B**) show swelling with no colour change. **C**) Histology of the lower lip reveals oedema, with partial myxedema, around the skeletal muscles and nerves without epidermal changes, accompanied by perivascular lymphocytic infiltration, intermingled with histiocytic infiltration (haematoxylin and eosin stain; ×100). **D**) A second skin biopsy from the upper lip shows a collection of histiocytes (*i.e.*, with epithelioid granuloma-like structure) in and around skeletal muscle in addition to similar findings in the first biopsy (haematoxylin and eosin stain; ×100). **E**) Detection of EBV in infiltrating lymphoid cells in the lips based on retrospective EBER-ISH (×100).