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A case of anti-NXP2 antibody-positive dermatomyositis with improvement of clinical symptoms and disappearance of autoantibody after resection of uterine cancer

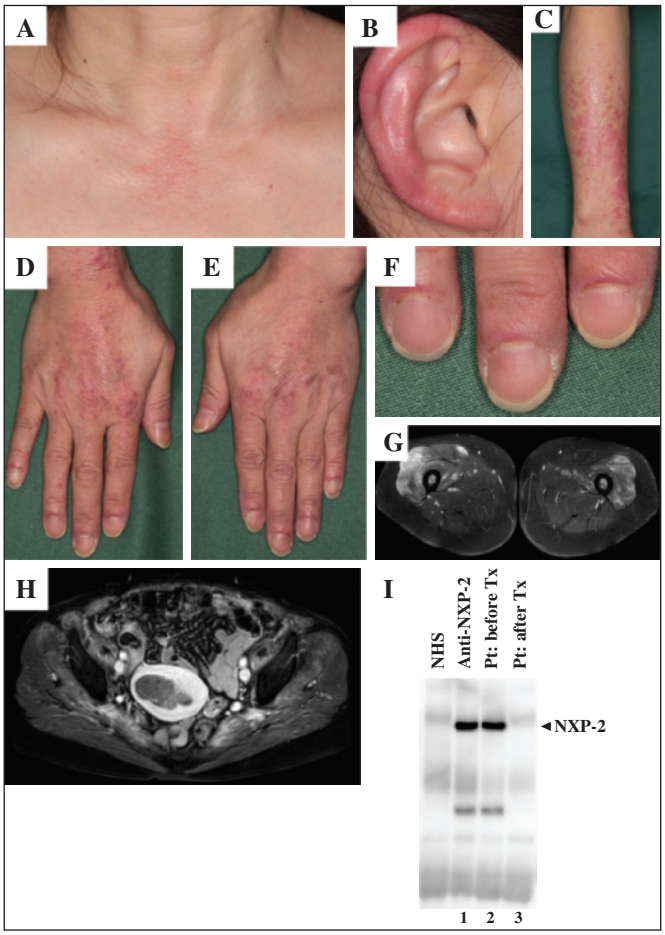

Figure 1. A) V-sign on the front neck. **B**) Diffuse erythema on the right helix. **C**) Slightly scaled invasive erythema on the left forearm. **D-E**) Gottron's sign on the hands. **F**) Periungual erythema and nailfold bleeding with irregular extension of the eponychium on the fingers. **G**) T2-weighted MRI of both thighs. **H**) Gadolinium-enhanced T1-weighted MRI of the pelvis. **I**) Immunoprecipitation/western blotting analysis showing NXP-2 protein precipitated in the serum before treatment (lane 2), but not detected after treatment (lane 3); Lane 1: anti-NXP-2 antibody-prototype serum.

A 51-year-old woman was referred to our hospital with a skin rash and muscle pain for one month. Skin examination revealed erythema on the neck, ears, and arms (*figure 1A-C*). She also had Gottron's sign, periungual erythema, and nailfold bleeding (*figure 1D-F*). Laboratory examinations demonstrated a high level of creatine kinase (CK) (277 U/L), whereas aldolase was within the normal range (5 U/L). High signal intensities in the quadriceps and hamstrings were observed on magnetic resonance imaging (MRI) (*figure 1G*). Pelvic MRI demonstrated a mass of 30 mm in diameter at the uterine corpus (*figure 1H*), which was confirmed to be uterine cancer by biopsy. Other internal malignancies or interstitial lung disease were not detected by computed tomography. Her anti-nuclear antibody (Ab) titre was increased 80-fold and produced a speckled pattern. Anti-MDA5 Ab, anti-TIF1 Ab, anti-Mi-2 Ab, and ant-ARS Ab were negative by enzyme-linked immunosorbent assay (ELISA). However, anti-nuclear matrix protein 2 (NXP2) Ab was detected by immunoprecipitation (IP)/western blotting [1] (*figure 1I*). The patient was diagnosed with anti-NXP2 Ab-positive dermatomyositis (DM) with uterine cancer. As her muscle symptoms were progressing, we prioritized the treatment of myositis before uterine cancer surgery. Although 30 mg/day of oral prednisolone was administered, her CK and aldolase levels increased, and muscle weakness and dysphagia developed. Therefore, a single cycle of methylprednisolone pulse therapy (1,000 mg/day for three days) was administered and oral prednisolone was increased to 50 mg/day. However, her muscle symptoms did not improve, and CK and aldolase levels increased further to 1,834 IU/L and 17 IU/L, respectively. Although myositis was not fully managed, we decided to perform surgery for uterine cancer. During the next three weeks, oral prednisolone was tapered to 20 mg/day and a single cycle of intravenous immunoglobulin (400 mg/kg/day for five days) was administered when oral prednisolone was given at 30 mg/day. After that, she underwent surgery and the cancer was removed. As the histological diagnosis put her in the low-risk group, postoperative chemotherapy was not administered. The NXP2 antigen was expressed on the whole area of the resected uterine tissue including the non-cancer area as well as the lesion of cancer. The CK level normalized within a few days after the operation (95 IU/L), and muscle weakness and dysphagia gradually recovered. Prednisolone was tapered and maintained at 1 mg/day with no recurrence of muscle or skin involvement. Anti-NXP-2 Ab disappeared eight months after the operation (*figure 1I*).

Anti-NXP2 Ab was first reported as anti-MJ Ab related to juvenile DM [2], and the antigen of anti-MJ Ab was subsequently identified as nuclear matrix protein NXP2 [3]. Approximately 20% of juvenile DM is positive for anti-NXP2 Ab, whereas only 1.6% of adult DM is positive. The clinical characteristics of anti-NXP2 Ab-positive DM in adult-onset cases include muscle weakness and skin eruptions. On the other hand, ILD is rare. Furthermore, in adult-onset myositis, 29% of patients developed malignant tumours within three years of diagnosis and most progressed [4]. Although there is a correlation between the progression of cancer and exacerbation of skin and/or muscle symptoms in DM, whether clinical symptoms are improved by tumour excision depends on the patient. It is unclear whether tumour excision can influence the autoAb status. Currently, it is not possible to assess a correlation between the titre of anti-NXP2 Ab and disease activity, since an ELISA system to detect anti-NXP2 Ab has not been established. This is the first case in which anti-NXP-2 Ab disappeared after tumour excision. The association between the pathophysiology of DM and skin and muscle involvement, presence of malignant tumours, and autoAb production is of interest. Further accumulation of cases is needed to address this issue. ■

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Octenidine disinfection during the SARS-CoV-2 pandemia

In view of the current worldwide COVID-19 outbreak with still rising cases outside of China, the World Health Organization (WHO) suggests personal protective measures in order to attenuate transmission of the virus. Along with good respiratory hygiene, distancing to others and personal isolation in case of respiratory symptoms, the WHO strongly recommends frequent washing of hands and alcoholic disinfection [1]. For hand disinfection, the Robert-Koch-Institut (RKI, German Public Health Institute) approved a list of mostly alcoholic, but also other disinfectants, such as halogens and peroxides [2]. As Sars-CoV-2 is an enveloped virus, it is particularly susceptible to lysis of its lipid membrane, which inactivates it. Hence, the mechanism of action of most hand disinfectants is solubilization of the virus lipid membrane by alcohol (mostly ethanol and 1- and 2-propanol).
We would like to propose the use of octenidine-containing disinfectants (mostly in combination with synergistically-acting phenoxyethanol), as they are recommended by the RKI for disinfection of the skin of newborns, but are not mentioned in the list outlined above.
Upon an exposure time of 60 seconds, octenidine-containing disinfectants act against enveloped viruses in a similar way to alcoholic disinfectants [3] and also display additional benefits; they do not burn irritated skin, are non-allergenic and do not penetrate the skin or act as penetration enhancers, like alcohols.
The most striking benefit is the remanence effect (prolonged biocidal activity on the skin) of this cationic detergent-like molecule. Compared to isopropanol disinfection alone, the addition of octenidine demonstrated a restriction of bacterial growth on the skin of up to 48 hours [4]. The molecule, which is also active against enveloped viruses, therefore demonstrates a long-lasting effect on the skin. Additionally, octenidine (0.1%) plus phenoxyethanol (2%) can be dissolved in water, making the preparation of large amounts easier in cases of global emergencies. For comparison, to prepare 10 litres of 70% (v/v) isopropanol, one needs to transport 7 litres (approximately 5.5 kg) of isopropanol (100%), whereas for 10 litres of octenidine disinfectant, only 210 g of chemicals are needed (<4% the weight), the latter also being less flammable.
In summary, the use of octenidine-containing disinfectants should be considered by the general population, mainly for prolonged self-protection, contrasting with the very short-acting alcoholic disinfectants, but also in order to reduce viral contamination of public surfaces (*e.g.* door handles, staircase handrails, and elevator buttons associated with public transport), where the virus remains stable for hours to days [5]. ■

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