

## Milker's Nodule – Case Report

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**SUMMARY** Milker's nodule (*noduli mulgentium*) is a benign viral skin disease caused by parapoxvirus, a poxvirus that is endemic in cattle. The virus is usually transmitted to cattle handlers from infected cows. We present a case of a 25-year-old housewife who milked cows on her family farm and developed itchy, purplish red nodules on her fingers and hands, and lymphangitis of the right arm. Two weeks before, several cows on her family farm were treated by a veterinarian under the diagnosis of pseudocowpox. She was treated with orally administered amoxicillin with clavulanic acid 2 g for 10 days, with complete resolution of lymphangitis. The nodules resolved in several weeks.

**KEY WORDS:** milker's nodule, poxviruses, infected cow

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### INTRODUCTION

Milker's nodule (*noduli mulgentium*) is a benign viral skin disease that generally consists of one or a few nodules on the hand or forearm. Rarely, other areas of the skin may be involved, or numerous lesions may be present. Lymphadenopathy is uncommon. The incubation period is usually 4 to 7 days, but may be as long as 2 weeks. In the absence of secondary bacterial infection, each lesion usually heals spontaneously in 4 to 6 weeks without scar formation (1).

The disease is caused by parapoxvirus, a poxvirus that is endemic in cattle (2). The virus is usually transmitted to cattle handlers from infected cows (1). Parapoxvirus can be propagated in bovine and human cells in tissue culture (3,4). The diagnosis is based on history (contact with infected animal – cow, sheep, goat) and clinical findings (5,6).

### CASE REPORT

A 25-year-old woman visited Outpatient Clinic at University Department of Dermatology and Venereology, Zagreb University Hospital Center, for papulovesicular lesions with a red center on the dorsum, palm and fingers of her right hand, and lymphangitis of the right arm (Fig. 1). A few lesions were also present on the fingers of her left hand. The lesions appeared about two weeks before on the fingers of her right hand when she visited her family doctor who prescribed topical antibiotic treatment. In spite of topical therapy, the lesions spread on the dorsum and palm of her right hand and they became painful. After ten days the right arm became partially reddish and painful, and she visited our Outpatient Clinic. Generally, the patient was healthy, without constitutional symptoms like fever and malaise, and without pathologic laboratory findings. According to medical history, the



**Figure 1.** Papulovesicular lesions with red center, surrounded by a white ring and red halo - two weeks of infection after the patient first visited the Clinic.

patient milked cows in which pseudocowpox had been diagnosed two weeks before and were treated by a veterinarian. The lesions developed as the result of the milking the infected cow. Culture of lesion biopsy was not done because the patient's medical history and clinical findings suggested the diagnosis. Samples were obtained for microbacterium testing (Department of Clinical Microbiology, National Institute of Public Health), considering secondary bacterial infection and severe clinical presentation.

The patient was immediately treated with orally administered amoxicillin with clavulanic acid 2 g for 10 days. Soon after systemic antibiotic administration, lymphangiitis of the right arm resolved and the patient felt no more pain. The lesions turned to firm, crusted nodules. As no bacteria were seen in direct (unstained) slide and Gram stained slide, and no cytopathic effect was observed after seven days of cultivation in cell cultures, no more systemic antibiotic was prescribed. Further topical treatment with potassium permanganate (KMnO<sub>4</sub>) baths for hands and antibiotic ointment was continued. At control check-up at 4 weeks, the lesions were firm, crusted nodules (Fig. 2). At the last control check-up at 6 weeks of the disease onset, the patient's hands were free from nodules and only slightly reddish discoloration persisted on the skin (Fig. 3).

## DISCUSSION

Milker's nodule (*noduli mulgentium*) has a worldwide distribution, occurring where cattle are found. Most cases are sporadic, but small epidem-



**Figure 2.** Firm, crusted nodules 4 weeks of the disease onset.

ics have been reported. Because the disease is usually transmitted to humans by direct contact with infected cattle, milkers are most at risk. Our patient got infected while milking the infected cow on her family farm. Indirect transmission from virus-contaminated material to patients with burned skin has been reported (7). The incidence of sub-clinical infection is not known. Although infectious virus is found in human lesions, person-to-person transmission under natural conditions has not been documented.

The disease is caused by parapoxvirus, a poxvirus that is endemic in cattle. Poxviruses are the largest of all vertebrate viruses. Electron microscopy shows them as brick-shaped, measuring 140-230 by 210-390 nm. Poxviruses cause a variety of diseases in humans and animals. Smallpox, which was eradicated in 1977, was the most important human poxvirus disease. Human poxvirus



**Figure 3.** Reddish discoloration persisting on the skin at 6 weeks of the disease onset.

infections include monkeypox, vaccinia, cowpox, buffalopox, camelpox, orf, milker's nodule, bovine papular stomatitis, sealpox, yabapox, tanapox and molluscum contagiosum. These infections are of relatively low prevalence, and with the exception of monkeypox they also are of low pathogenicity (8,9).

In cows the condition is called pseudocowpox. In cows, lesions begin as small red papules on the teats or udder. These may be followed rapidly by scabbing, or small vesicles or pustules may develop before the formation of scabs. Some lesions persist for several months, giving the affected teats a rough feel and appearance, and further scabs may form. The infection spreads slowly throughout milking herds and a variable percentage of cows show lesions at any time. Cattle may be reinfected in subsequent lactations. On making the diagnosis the scabbed lesions may be confused with warts or mild traumatic injuries to teats and udder. Scabs examined by electron microscopy will frequently show the characteristic virus particles. In cows, control of infection by taking hygienic measures such as teat dipping to destroy the virus and prevent transmission is important (10). The cows on the family farm of our patient were controlled by a veterinarian who diagnosed pseudocowpox and ordered hygienic measures.

A typical case of milker's nodule consists of a single asymptomatic or slightly painful 1-cm nodule on a finger. There are usually no more than four lesions, and they are generally confined to the hand and forearm (11,12). The diagnosis is based on history (contact with infected animal – cow, sheep, goat) and clinical findings (4,5). Our patient had numerous lesions on the fingers, dorsum and palm of the right hand and a few lesions on the fingers of the left hand. She also developed lymphangitis of the right arm. The diagnosis was based on history (contact with infected cow) and clinical findings.

Because of severe clinical presentation in our patient, we suspected secondary bacterial infection and samples for microbacterium testing were obtained (Department of Clinical Microbiology, National Institute of Public Health).

For microbiological diagnosis, 1 mL of sample was taken from the affected nodular skin lesion using sterile needle and syringe. In direct (unstained) slide epithelial skin cells were seen. In Gram stained slide, stained epithelial skin cells were also seen. No bacteria were detected. No cytopathic effect was observed in cell cultures after seven days of cultivation or by daily observation.

There was no secondary bacterial infection in our patient.

The incubation period is usually 4 to 7 days, but may be as long as 2 weeks. In the absence of secondary bacterial infection, each lesion usually heals spontaneously in 4 to 6 weeks without scar formation.

Leavell and Phillips have described six clinical stages, each lasting for about a week. Initially, the lesion begins as an erythematous macule, which soon becomes papular. The target stage is next: the lesion, which is papulovesicular, has a red center, surrounded by a white ring and a red halo. This stage is followed by a period of weeping and erosion. The lesion then becomes a firm, crusted nodule. Next, small papillomatous elevations develop on the nodule. Finally, during the regressive stage, the lesion darkens and sloughs (12). We saw our patient first time when her lesions were papulovesicular and we followed all the clinical stages of the disease described (Figs. 1, 2 and 3).

Milker's nodule (*noduli mulgentium*) must be differentiated from many other conditions, including true cowpox, herpetic whitlow, pyoderma, anthrax, tularemia, primary inoculation tuberculosis, atypical mycobacterial infection, syphilitic chancre, sporotrichosis, and pyogenic granuloma (1).

Although the disease is mostly self-limited, antibiotic therapy is suggested to avoid potential second attacks and disease persistence. To prevent the spread of the disease, it is advised to use gloves while milking cattle.

Zoonoses with dermatological symptomatology as occupational dermatoses were most urgent in the 1950s and 1960s. At present, we no longer encounter dermatological forms of tuberculosis caused by *Mycobacterium bovis*, occupational dermatological forms of anthrax, brucellosis, malleus, etc. There are sporadic infectious ulcers of milkmaids and erysipeloid.

Comprehensive solution of occupational zoonoses with dermal symptomatology is a question of interdisciplinary collaboration including a dermatologist/venereologist, infectionist, epidemiologist, occupational hygienist, veterinary surgeon and finally a specialist in occupational medicine to evaluate the occupational character of the disease (13).

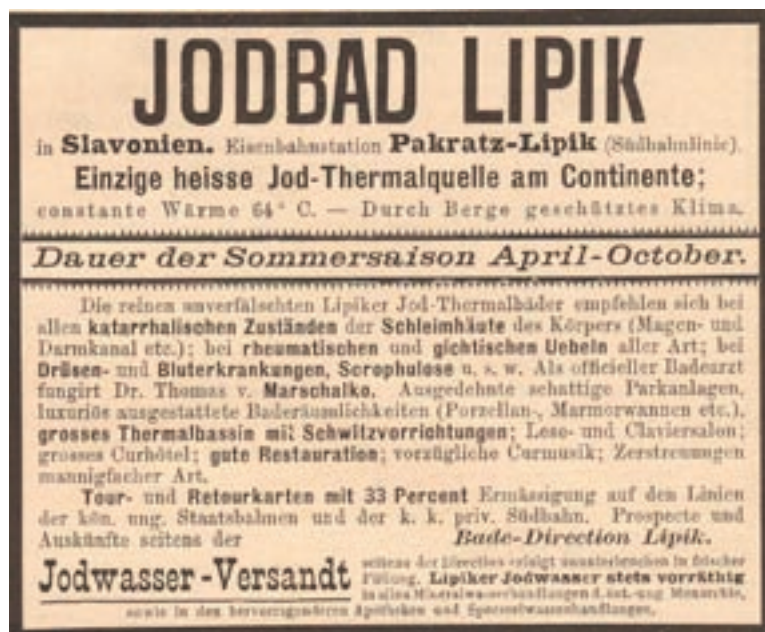
## CONCLUSION

Milker's nodule is a benign viral skin disease that generally consists of one or a few nodules on the hand or forearm. Although it is mostly self-lim-

ited, antibiotic therapy is suggested to avoid the potential second attacks and disease persistence. The diagnosis is based on history (contact with infected animal – cow, sheep, goat) and clinical findings. It is considered as an occupational disease, so appropriate preventive measures should be taken.

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