

AUTONOMIC DENERVATION DERMATITIS IN TWO PATIENTS

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Abstract

Autonomic denervation dermatitis (ADD) is the term used for eczematous eruptions occurring at the site of surgical incision and adjoining skin after a varying lag period. ADD specific to total knee replacement surgery occurring around the healed surgical scar area has been called SKINTED (surgery of the knee, injury to the infrapatellar branch of the saphenous nerve, traumatic eczematous dermatitis). It is believed that transections of dermal nerve leading to autonomic disturbance in the involved area contribute to the development of dermatitis. Hereby we report two cases of autonomic denervation dermatitis.

Key words: Autonomic denervation dermatitis, SKINTED, total knee replacement.

Introduction

Various terminologies have been used for eczematous eruptions occurring at the site of surgical procedures. In 2009, Verma and Mody reported post surgical eczematous eruptions as “surgery of the knee, injury to the infrapatellar branch of the saphenous nerve, traumatic eczematous dermatitis” (SKINTED).^[1] The term “posttraumatic eczema” (PTE) has also been used for a similar condition. However, this term is also nonspecific and misleading as all traumas do not lead to eczematous lesions. In 2017, Madke et al described ten patients with localized itchy, xerotic, scaly and erythematous rashes consisting of papules and oozing plaques occurring exclusively on the surgical incision sites and adjoining area. They suggested the term “autonomic denervation dermatitis” for these particular eruptions.^[2] However, currently there is no consensus regarding the correct terminology for this peculiar dermatoses.

We report two patients (1 male and 1 female) who underwent surgeries for total knee replacement. They presented to us with localized itchy, xerotic, scaly and erythematous lesions consisting of erythematous to hyperpigmented papules and plaques over the surgical incision sites and adjoining area.

Case Summary

Case 1

A 70 year old male farmer by occupation presented to us with localized itchy dry lesions over both knees adjacent to surgical scars since 1-2 months. On examination, there was a linear healed postsurgical scar over the both knees starting from the lower anterior part of the thigh, crossing the patella. There were multiple discrete to confluent hyperpigmented papules and plaques with intermittent fissuring on a xerotic background at surgical incision sites and adjoining areas. On palpation, both affected areas were non-tender with no raised temperature. Patient had history of total knee replacement for osteoarthritis 1.5 years back.

Skin biopsy from the lesion over right knee showed changes suggestive of chronic spongiotic dermatitis.

Case 2

A 49 year old female presented with localized itchy red lesions with watery discharge over both lower limbs adjacent to surgical scar since 20 days. On examination, multiple discrete to

confluent irregular erythematous papules and plaques with intermittent fissuring and scaling were present over both knees extending to thighs at surgical incision site and adjoining area. On palpation, both affected areas were non-tender with no raised temperature. There was history of total knee replacement one year back.

The patient did not give consent for skin biopsy procedure.

In both the cases, postoperative period was uneventful. There was no history of use of any topical agent, local disinfectant, contact allergen during the postoperative period. Complete blood counts and serum biochemistry was within normal reference range. Patch testing could not be done due to institutional constraints.

Based on clinical presentation, history and existing literature, a diagnosis of autonomic denervation dermatitis was finally made. Our both cases presented with bilateral involvement after total knee replacement of both the knees.

DISCUSSION

The nervous network in the skin consists of somatic sensory fibers and sympathetic autonomic fibers with frequent branching. Autonomic nerve fibers constitute only a minority of cutaneous nerve fibers and are distributed along with sensory fibers in the dermis. They are restricted to the dermis and innervate blood and lymphatic vessels, arteriovenous anastomoses, erector pili muscles, eccrine glands, apocrine glands, and hair follicles. Thus, cutaneous nervous system regulate sweat gland function, vasomotor activity, skin blood flow and body temperature homeostasis. Skin barrier function is a result of complex and poorly understood processes and normal functioning of sweat glands, sebaceous glands, and cutaneous microcirculation (which in turn depends on autonomic nerve activity) appears to be necessary for maintenance of the skin barrier.^[3] Additionally, acetylcholine and catecholamines secreted from autonomic nerve endings are thought to play a role in skin barrier homeostasis as they affect keratinocyte proliferation, adhesion, migration, and differentiation.^[4]

The term “autonomic denervation dermatitis (ADD)” in postsurgical patients was proposed by Madke et al in 2017 who reported 10 patients with similar presentation in their case series.^[2] In 2009, Verma and Mody reported a similar

presentation in 55 patients as “surgery of the knee, injury to the infrapatellar branch of the saphenous nerve, traumatic eczematous dermatitis” (SKINTED).[1] However, SKINTED is a site- and procedure-specific diagnosis whereas ADD is applicable to all eczematous eruptions at or around surgical sites irrespective of site and nature of the operative procedure. Skin incisions lead to traumatic transections of dermal nerves causing denervation of various autonomic organs of the skin. The role of autonomic function in maintaining skin barrier function and release of neuropeptides following nerve regeneration may be responsible for eczematous eruptions. These conditions are differentiated from posttraumatic eczema which, develops within 2–4 weeks of trauma at and around sites of mechanical, thermal, chemical injury, but ADD takes months to years to develop.

The infrapatellar branch of the saphenous nerve, a purely sensory nerve, crosses the inferior knee from medial to lateral and innervates the skin below the patella as well as the anterior inferior knee capsule. It is most often resected during total knee replacement surgery using median parapatellar incision. Infrapatellar nerve damage causes hypoesthesia and cutaneous eruption by altering the barrier function of the epidermis and keratinocytes behaviour.^[5]

In conclusion, this condition is relevant to both Dermatology and orthopaedics. As the exact clinical course of ADD is still uncertain patients should be adequately counselled about the

chronic course of the dermatoses. They should be encouraged to use liberal amounts of emollients and occlusive moisturizers to maintain skin barrier integrity and to avoid steroid dependence. We look forward to further research into this entity and its pathogenesis.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms.

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