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Case Series

SKINTED: An unfamiliar and overlooked complication of total knee arthroplasty

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Abstract: Surgery of the Knee, injury to the infrapatellar branch of the saphenous nerve, Traumatic Eczematous Dermatitis (SKINTED) is a neuropathic dermatitis secondary to iatrogenic injury to infrapatellar branch of the saphenous nerve during the surgeries around the knee, mainly total knee arthroplasty (TKA). The infrapatellar branch of the saphenous nerve is most often resected during total knee replacement surgery using median para-patellar incision. It is an underreported entity in dermatology literature. In this paper, we report 5 cases of SKINTED who presented with eczematous rash over knee after several months of TKA. Dermatologists as well as orthopedicians should be well aware of this manageable condition as its timely diagnosis and treatment can prevent unnecessary dissatisfaction in patients who have undergone TKA.

Keywords: SKINTED, total knee arthroplasty, neuropathic dermatitis

Introduction

Surgery of the Knee, injury to the infrapatellar branch of the saphenous nerve, Traumatic Eczematous Dermatitis (SKINTED) is a neuropathic dermatitis secondary to iatrogenic injury to infrapatellar branch of the saphenous nerve during the surgeries around the knee, mainly total knee arthroplasty (TKA) [1]. Infrapatellar branch of the saphenous nerve lies subcutaneously, making it extremely susceptible to injury during knee surgeries. It supplies anterolateral aspect of knee below the patella [2]. We report five such cases who presented with eczematous rash over knee after several months of TKA.

Case history

Clinical details of cases are given in table, figure 1A-1B and figure 2. For all cases immediate pre and post-op periods were uneventful. There was no prior history of atopy or metal allergy or other allergic conditions. Patients did not use any topical agent or irritant prior to the onset of skin lesions. There was no history of any chronic illness except hypertension and diabetes in case 3 and 4 respectively.

Table 1: Clinical details of patients

Clinical features	Case 1	Case 2	Case 3	Case 4	Case 5
Age (years)	55	60	57	62	61
Sex	M	M	F	M	F

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Pruritus	Mild	Absent	Mild	Absent	Mild
Duration of lesions (months)	4	5	3.5	4	3
Time lapsed after TKA (months)	10	11	9	10.5	8
TKA site	Bilateral	Right knee	Bilateral	Left knee	Bilateral
Site of cutaneous lesions	Bilateral	Right knee	Bilateral	Left knee	Bilateral
History of any chronic illness	None	None	Hypertension	Diabetes	None
Morphology of lesions	Lichenified plaques with yellowish brown crusting at places	Erythematous plaque without much superficial skin changes	Multiple erythematous papules (few excoriated) and background lichenification	Erythematous papules (few oozy) and plaque with mild superficial scaling	Lichenified plaques with surrounding scattered erythematous papules
Background xerosis	Present	Present	Absent	Present	Present
Recurrence	None	None	None	None	Milder recurrence after 3 months, responded well to emollients

Fig 1A: Well defined, hyperpigmented lichenified plaques with yellowish brown crusting at some places present over lateral aspect of right knee, lateral to surgical incision site

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Fig 1B: Well defined, hyperpigmented lichenified plaques with yellowish brown crusting at some places present over lateral aspect of left knee, lateral to surgical incision site

Fig 2: Well defined erythematous plaque located strictly lateral to the incision site over right knee without much superficial skin changes

Lesions had normal temperature and were non-tender. In all cases, cutaneous lesions were limited to the lateral side of surgical scar. Mild hypoesthesia to touch and pin-prick was confined lateral to the incision site while medial side demonstrated normal sensation. Surrounding skin was unremarkable. No signs of venous stasis were found in any cases. Rest of the muco-cutaneous examination was normal. All cases had well-functioning knees post-surgery.

Gram's stain and KOH examination were negative. Patch test to the implanted material was negative. Routine investigations like complete blood count, liver and kidney function test, serum IgE and random blood sugar were all within normal limit.

All cases were prescribed medium potency topical steroid and emollient for 4 weeks. Patients responded well to therapy and there was no recurrence after 6 months of follow-up except in case 5 who had milder recurrence after 3 months of follow-up, which resolved with emollient.

Discussion

Verma and Mody coined the term SKINTED in 2009. They published largest series of such 55 cases. The infrapatellar branch of the saphenous nerve is most often resected during total knee replacement surgery using median para-patellar incision. This leads to hypoesthesia and cutaneous eruption lateral to the incision site. Anatomical variation in the nerve in different patients and between both knees in same person can explain why not every patient develops

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this complication and why it is mostly unilateral in bilateral TKA [1]. Similar cutaneous condition and hypoaesthesia has been described at saphenous vein grafting site for coronary artery bypass grafting [3]. Both conditions are example of traumatic eczematous dermatitis, while SKINTED being specific to TKA. Cutaneous eruptions follow after a period of 3 weeks to 6 months [4]. Altered epidermal skin barrier leading to increased trans-epidermal water loss with resultant xerosis and itchy eczematous eruption following injury to the innervating cutaneous nerve, is the postulated patho-mechanism behind this entity. Denervation also leads to deprivation of neuropeptides like substance P and acetylcholine which are essential for normal keratinocyte function thus leading to inflammation and epidermal barrier defects [1]. Following differentials should be kept in mind while making a diagnosis of SKINTED. Allergic contact dermatitis is localized to the area of application/contact of the offending agent and presents within 1 to 2 weeks of exposure. It is characterized by intensely pruritic erythematous papules, vesicles, and bullae. Infection to the incision site will give classic signs and symptoms of increased surgical site pain, warmth, wound drainage, and fever. Metal hypersensitivity dermatitis is a rare complication after TKA and is usually a diagnosis of exclusion. It typically presents with swelling and synovitis around the prosthesis. Rarely can it manifest with localized or generalized pruritic erythematous scaly papules on both sides of incision, eczematous eruption extending to the neck, buttock, and extremities, after an interval of 2 months to 2 years postoperatively. Personal and family history of metal allergy may be positive. This also responds well to topical steroids but recurrences are common, while SKINTED presents only lateral to the incision site, less pruritic and uncommon recurrences [4]. Posttraumatic eczema/dermatitis occurs at and around sites of mechanical, thermal, chemical injury within 2-4 weeks of trauma, while SKINTED takes months to years to develop. Unlike SKINTED, neuropathic dermatitis has underlying sensory or motor neuropathy [5].

Conclusion

SKINTED can lead to dissatisfaction from patient and raise apprehension of orthopaedician. As not all cases of TKA develops SKINTED, caution should be exercised intra-operatively to minimize damage to the nerve. Proper identification of the entity and its differentiation from other conditions can alleviate un-necessary burden to patient and surgeon.

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