CASE REPORT

# Case Report: Solitary mastocytoma treated successfully with topical tacrolimus [version 1; peer review: 2 approved, 1 approved with reservations]

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## Abstract

Solitary mastocytoma, a rare dermatological entity accounts for 10-15% of cutaneous mastocytosis. We report a rare case of solitary mastocytoma presenting at birth, treated successfully with topical tacrolimus. Along with reassurance and strict avoidance of triggering factors, no recurrence was reported within the one year follow-up period.

**Open Peer Review**

**Approval Status** ✓ ? ✓

| | 1 | 2 | 3 |
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| **version 1** 01 Aug 2014 | ✓ view | ? view | ✓ view |

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2. **Robert Sidbury**, Seattle Children's Hospital, Seattle, WA, USA
3. **Regina Fölster-Holst**, Universität Kiel, Kiel, Germany

Any reports and responses or comments on the article can be found at the end of the article.

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## Introduction

Solitary mastocytoma, a rare dermatological entity, represents the second most common type of cutaneous mastocytoma. Solitary mastocytomas constitute 10–20% of all childhood cutaneous mastocytosis. They usually present within 2 years of age, mostly within first 3 months[1].

We report a case of solitary mastocytoma presenting a birth that was treated successfully with topical tacrolimus with no recurrences noted during a one year follow-up period.

## Case report

An eighteen month old girl presented with a solitary, itchy dark coloured, minimally elevated lesion over her left elbow that had been evident since birth. The lesion used to itch and swell on scratching, bathing and toweling of the area. The child was otherwise healthy and no other systemic manifestations were noted. Clinical examination revealed a solitary, 3.5 × 6.5 cm, non-tender, minimally elevated plaque with central shiny skin and peripheral marginal hyperpigmentation over left elbow. On scratching the lesion with the blunt end of a pin, the central shiny skin became edematous and itchy (positive Darier's sign) (Figure 1). Hematological and biochemical investigations were within normal limits. A 5 mm biopsy of the skin tissue obtained from the center of the lesion revealed a dense monomorphic inflammatory infiltrate consisting of round to oval cells with clear cytoplasm and centrally located nuclei in the upper and mid dermis (Figure 2a, 2b). Special staining with toluidine blue revealed metachromatic staining of the monomorphic mast cells, confirming the diagnosis of mastocytoma (Figure 3).

The child was treated with topical tacrolimus 0.03% ointment which was applied on the lesion site twice daily. The child was also prescribed an oral antihistamine (levocetirizine syrup, 1.25 mg once a day). By the end of third month, complete subsidence of the lesion was noticed with residual hyperpigmentation, negative Darier's sign, and no signs of atrophy. This treatment was continued for another four months which led to resolution of the lesion with residual hyperpigmentation, negative Darier's sign, and no signs of atrophy. Treatment was continued with only a once a day

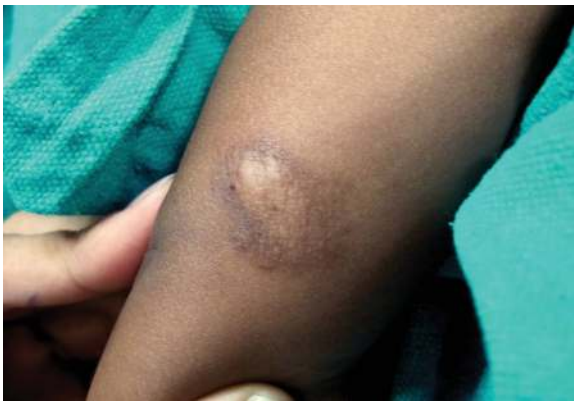

**Figure 1. A solitary, 3.5 × 6.5 cm, non-tender, minimally elevated plaque with edematous central shiny skin made more apparent on scratching the lesion with the blunt end of a pin (positive Darier's sign) with peripheral marginal hyperpigmentation over the left elbow.**

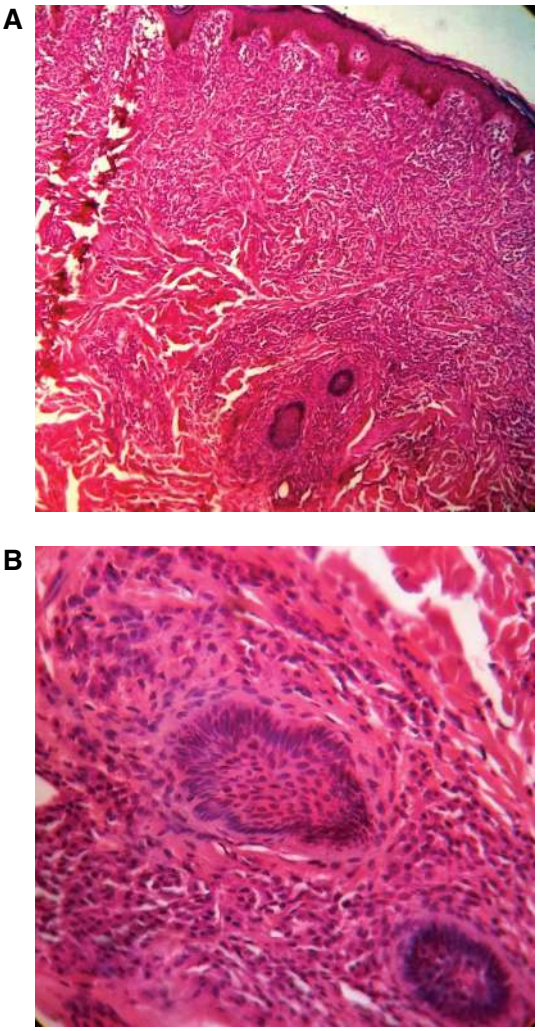


**Figure 2. a**, Dense monomorphic inflammatory infiltrate in upper and mid dermis; **b**, Dense monomorphic inflammatory infiltrate consisting of round to oval cells with clear cytoplasm noted at 40× magnification.

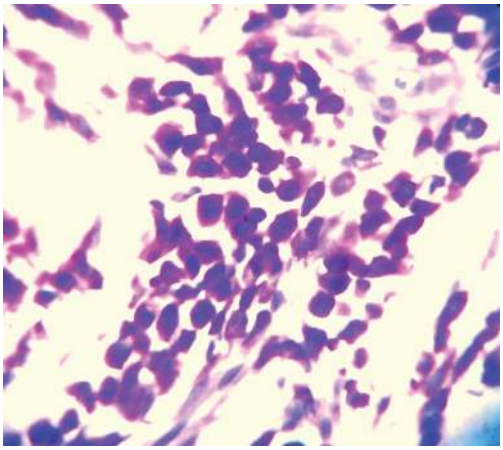

**Figure 3. Metachromatic staining of the monomorphic mast cells with Toluidine blue staining.**

application of topical tacrolimus for a month after clinical resolution to prevent further recurrence (Figure 4). Reassurance and strict avoidance of triggering factors such as pressure, friction (rubbing or toweling of the lesion), extreme temperature changes, intake of mast cell degranulating agents like aspirin, NSAIDS, morphine, codeine (especially in the form of cough preparations) has led to no recurrence of the child's symptoms during a 1 year follow-up period.

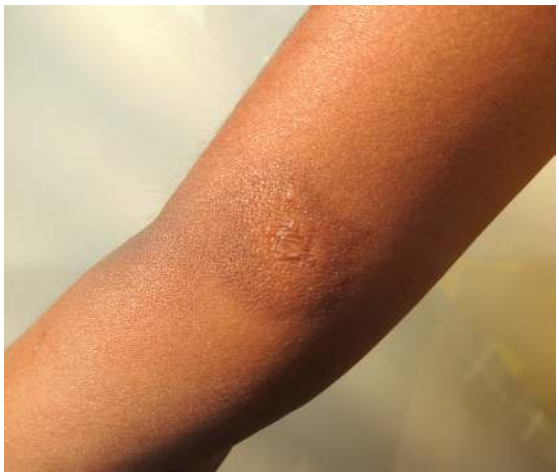

**Figure 4. Complete subsidence of the lesion with residual marginal pigmentation noted at the end of three months of therapy.** The central atrophic scar due to biopsy can be seen in the centre of the lesion.

## Discussion

Solitary mastocytoma, the second most common type of cutaneous mastocytosis, accounts for 10–15% of cutaneous mastocytosis[1]. Nearly half of solitary mastocytomas present within the first 3 months of life and the remaining half during the first year[2]. Solitary mastocytoma presenting in adults has also been noted[3]. The most common locations of mastocytomas are on the trunk, neck, and arms.

Most solitary mastocytomas are about 1–5 cm in diameter and are seen as skin areas that are colored yellow to brown and present as minimally elevated plaques with a smooth shiny surface having a soft to rubbery consistency. The lesion turns edematous and itchy on manipulation [rubbing or trauma to the lesion]. Mild tenderness and the formation of vesicles or bulla can also occur[4]. These features can sometimes be so mild that they may not come to the attention of parents.

Diagnosis is by biopsy that reveals a dense monomorphic inflammatory infiltrate consisting of round to oval mast cells containing a clear cytoplasm and centrally located nuclei in the dermis. Confirmation of diagnosis is usually by special staining with toluidine blue that reveals the metachromatic staining of the monomorphic mast cells[5].

The course of solitary mastocytomas is benign and the disease is self-limited. Systemic involvement is uncommon and complete spontaneous resolution is expected in months to years' time. Reassurance along with avoidance of triggering factors such as pressure, friction (rubbing or toweling of the lesion), physical exertion, extreme temperature changes, emotional stress, intake of mast cell degranulating agents like aspirin, NSAIDS, morphine, codeine (particularly in cough preparations), alcohol and radio contrast dyes are of utmost importance[6].

In symptomatic patients, oral H1 and H2 antihistamines are commonly used. Topical steroids with or without occlusion, intralesional steroids, oral sodium cromoglycate, oral ketotifen and surgical excision are other treatment options[6,7]. Though topical steroids have shown good results, their topical and systemic side effects are a matter of concern, especially when treating infants.

Tacrolimus and pimecrolimus are topical immunomodulators, the first in a new class of topical calcineurin inhibitors. These drugs act as immunosuppressants by binding to a cytosolic ligand in the cytoplasm of T cells called FK506-binding protein (FKBP) and inhibit the cytoplasmic enzyme calcineurin, thus inhibiting the activation and maturation of T cells and blocking transcriptional activation of several cytokine genes – interleukin (IL)-2 [mainly], IL-4, IL-10, interferon-γ, tumor necrosis factor-α, and granulocyte–macrophage colony-stimulating factor[8].

Other immunomodulatory effects of tacrolimus include the inhibition of mast cell adhesion and the inhibition of the release of mediators from mast cells and basophils[9], which might explain its efficacy in the improvement of the lesion and alleviation of the symptoms in cutaneous mastocytosis.

These immunomodulators offer advantages over corticosteroids in terms of a more selective action, no associated systemic side-effects, and the absence of associated skin atrophy, depigmentation and telangiectasia.

This case report demonstrates that topical calcineurin inhibitors can be considered as a safe and efficacious modality of treatment in cutaneous mastocytoma.

## Consent

Written informed consent for publication of the clinical details and clinical images was obtained from the father of the patient.

### Author contributions

Dr. Sukesh M.S. and Dr. Ameet Dandale were involved in clinical diagnosis, work-up, treatment and writing up of this case report. Dr Smita Ghate contributed to the histopathologic diagnosis, Dr Rachita Dhurat contributed to the conception and design and final approval of the paper; Dr Ankur Sarkate contributed to the assimilation of all data and the histopathological pictures.

### Competing interests

No competing interests were disclosed.

### Grant information

The author(s) declared that no grants were involved in supporting this work.

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PubMed Abstract | Publisher Full Text

# Open Peer Review

## Current Peer Review Status: ✔ ? ✔

**Version 1**

Reviewer Report 19 August 2014

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✔ **Regina Fölster-Holst**
Dermatologische Klinik, Universität Kiel, Kiel, Germany

The authors described an 18-mo old girl with a solitary mastocytoma, which was successfully treated with tacrolimus. This might suggest that the mastocytoma requires therapy. This is not the case. Mastocytomas are self-limited and usually don´t need therapy. The most important management is the avoidance of known trigger factors. It is not clear whether the reduction is due to the self-limiting nature of the tumor or to the therapy.

Pathogenetically and from the mechanism of action of tacrolimus, which prevents mast cell degranulation, an improvement of mastocytoma can be expected. However it should be made clear that the indication for treatment of a solitary mastozytoma should be made very cautiously.

***Competing Interests:*** No competing interests were disclosed.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**

Reviewer Report 19 August 2014

https://doi.org/10.5256/f1000research.3493.r5676



? **Robert Sidbury**
Dermatology Division, Seattle Children's Hospital, Seattle, WA, USA

I thank the authors for this interesting article.

I believe it is worthy of indexation because there is surprisingly little in the literature about this alternative treatment. I might make a few small suggestions for consideration:

1. Is solitary mastocytoma really "rare"? I see an awful lot of them for such a designation even taking into consideration referral bias. Uncommon might be a better descriptor.

2. Could the line "*Diagnosis is by biopsy...*" be modified? I do not think these absolutely must be biopsied and in fact almost never do. If there is a + Dariers sign and a strong clinical suspicion this presentation is specific enough that I do not think biopsy is mandatory. As a pediatric dermatologist I do all I can to avoid biopsying when not absolutely necessary and I worry readers might take this line to imply diagnosis mandatory for diagnosis of mastocytoma. It is not.

3. Can we still call tacrolimus and pimecrolimus "new" given they have been available almost 15 years now?

4. I think in fairness the authors must mention the boxed warning about this class of medications somewhere. If the authors cite the concerns for topical and systemic side effects of topical steroids as they do I think they must balance this by mentioning the biggest barrier to using these agents - the black box.

5. I might have included two references the authors omitted:

- Correia O, Duarte AF, Quirino P *et al.*: Cutaneous mastocytosis: Two pediatric cases treated with topical pimecrolimus. *Dermatology Online Journal.* 2010;**16**(5): 8

  This describes two cases similar to the authors' treated successfully with pimecrolimus

- Avshalumov K, Pichardo R, Jorizzo JL *et al.*: Bullous mastocytosis: report of a patient and a brief review of the literature. *Am J Dermatopath.* 2008; **30**(5):455-7

  Cutaneous mastocytosis - albeit not mastocytoma - treated with a number of things including topical tacrolimus.

***Competing Interests:*** No competing interests were disclosed.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.**

Reviewer Report 05 August 2014

https://doi.org/10.5256/f1000research.3493.r5674

**Mohamed Badawy Hassan Tawfik Abdel-Naser**
Faculty of Medicine, Ain Shams University, Cairo, Egypt

- In the abstract and introduction sections the authors stated that solitary mastocytoma accounts for 10-15% of cutaneous mastocytosis whereas in the introduction section it was 10-20%.
- The lesion was present since birth, but parents sought medical advice after 18 months. Was there any particular reason for this delay? In particular, was any other previous treatment(s) prescribed for the child?
- The magnification of Fig, 2 was mentioned as 40X but it seems that Fig. 2A and 2B have different magnifications. Authors should also insert the magnification of Fig.3.
- As per any case report describing a treatment for a disorder known to be self-limited, it is uncertain whether the resolution is due to the applied drug or due to natural spontaneous subsidence.

***Competing Interests:*** No competing interests were disclosed.

**I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.**