

## Lentigo maligna occurring in a patient with the past history of laser therapy

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A 70-year-old Japanese woman visited our clinic with a pigmented patch on her face from her upper lip to under her nose following laser therapy 15 years ago. Physical examination revealed an asymmetrical dark brown macule with a clear border along with irregular black dots measuring 20 mm. A biopsy specimen showed some irregular-sized atypical melanocytes with deep-colored nuclei on staining. There were observed on the basal layer and a few of them in the prickle-cell layer only in the epidermis. We diagnosed this case as lentigo maligna (LM). Total resection and reconstruction with the Abbe flap were carried out. We searched previous literature for reports on laser therapies resulting in LM and determined the following: (1) there were no reports indicating that laser therapy is one of the causes of LM, (2) judging from invalidity of treatment or recurrence of the condition, laser therapies were considered ineffective for LM treatment, and (3) the numbers of patients undergoing laser therapies, who were not diagnosed with LM, were increasing.

**Key words:** Lentigo maligna, Laser therapy

### INTRODUCTION

LM is a subtype of melanoma that develops in sun-damaged skin. If left untreated, LM can progress to invasive lentigo maligna melanoma (LMM). The frequency at which LM progresses to LMM is unknown, with a reported risk of transformation ranging from less than 2.2% to up to 50% [1, 2]. The most commonly performed and accepted method of LM is surgical excision [3]. However, in LM cases where the lesion is large or conspicuous location or if the patient is of an advanced age, laser therapies were employed for treatment [4-9]. On the other hand, some cases were treated using laser therapy followed by a wrong diagnosis of the condition as benign lentigo, actinic keratosis, lentigo senilis, etc [10-14]. We described a case of LM following a laser treatment and discussed the following issues. (1) Can laser therapy cause LM? (2) Are laser therapies effective for LM treatment? (3) Are there other cases in literature in which treated laser therapies were used for treatment, and the condition was misdiagnosed as another pigment diseases, like this case?

### CASE REPORTS

A 70-year-old Japanese woman visited our clinic with a pigmented patch on her face from her upper lip to under her nose. She noticed it 20 years ago and stated that underwent laser therapy. However, since it was conducted 20 years ago, we could not confirm the details of the laser therapy. It recurred 5 years ago and was growing until her visit to our clinic. There was no relevant family history.

A physical examination revealed an asymmetrical

dark brown macule with a clear border along with irregular black dots measuring 20 mm (Fig. 1). She was clinically diagnosed with LM.

A skin biopsy from the center of macule was conducted before preparing for immediate total resection. A biopsy specimen showed some irregular-sized atypical melanocytes with deep-colored nuclei on staining. These were observed on the basal layer and a few of them were in the prickle-cell layer, only in the epidermis (Fig 2).

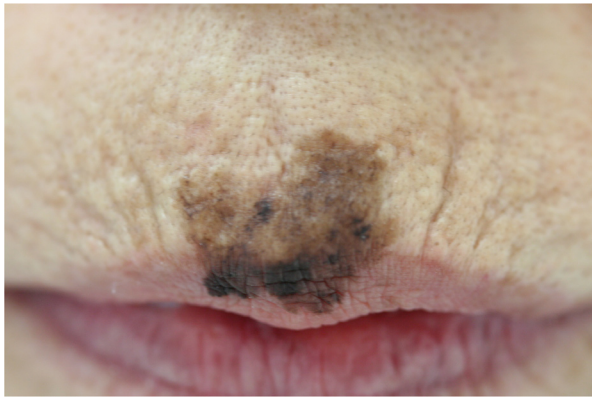
From these findings, we diagnosed this case as lentigo maligna. Total resection and reconstruction with the Abbe flap [15] were conducted 2 weeks after biopsy.

### DISCUSSION

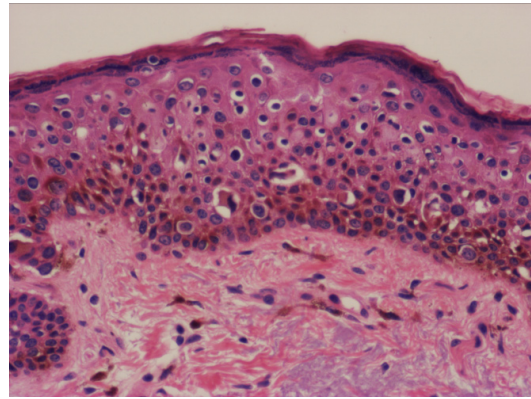
Our patient exhibited a pigmented lesion in the same lesion that was treated with laser therapy 15 years ago. However, we could not confirm the details of the laser therapy, such as the first physical examination, diagnosis, the type of laser used, etc, adopted during the previous treatment. Therefore, we questioned the patient and assumed that she underwent laser treatment according to the diagnosis; this is discussed in Table 1.

We examined the following 3 points (1) Can laser therapy cause LM? (2) Are laser therapies effective for LM? (3) Are there reported cases in which laser therapies were used for treatment and the condition was misdiagnosed as another pigment disease, like this case?

1) We searched through literature in Japana Centra Revuo Medicina and PubMed. But we couldn't find out the case of which the cause of LM was laser therapy.



**Fig. 1.** Physical examination revealed an asymmetrical dark brown macule with a clear border along with irregular black dots measuring 20 mm.



**Fig. 2.** Histological findings reveal that some atypical melanocytes were on the basal layer and a few of them were in the prickle cell layer only in the epidermis.

**Table 1** The contents of which were examined about the laser treatment of the lentigo maligna

• Use example after diagnosis of lentigo maligna
• Type of laser
• Recurrence
• Use example before diagnosis of lentigo maligna
• Type of laser
• First diagnosis

**Table 2** Laser therapies for lentigo maligna

Type of laser	Number	Invalidity or Recurrence
Argon laser	4 cases	2 cases (50%)
Carbon dioxide laser	4 cases	None
Q-switched ruby laser	5 cases	2 cases (40%)
Q-switched YAG laser	8 cases	6 cases (75%)

**Table 3** Laser therapies for not diagnosed as lentigo maligna

Year	Reporter	First diagnosis	Type of laser
1998	Lee <i>et al</i> <sup>8)</sup>	Benign lentigo	Q-switched ruby laser
		Actinic keratosis	Q-switched ruby laser
2004	Ando <i>et al</i> <sup>9)</sup>	Missing	Carbon dioxide laser
2005	Kasai <i>et al</i> <sup>10)</sup>	Lentigo senilis	Q-switched ruby laser
			Carbon dioxide laser
2005	Kawaguchi <i>et al</i> <sup>11)</sup>	Lentigo senilis	Q-switched ruby laser
2007	Kurihara <i>et al</i> <sup>12)</sup>	Missing	Ruby laser

2) We found out 21 cases (argon laser: 4 cases, carbon dioxide laser: 4 cases, Q-switched ruby laser: 5 cases, Q-switched yttrium-aluminum-garnet laser (Q-switched YAG laser): 8 cases) in which laser therapies were carried out for LM treatment [4-9] (Table 2). Nine cases (argon laser: 2 cases, Q-switched ruby laser: 2 cases, Q-switched YAG laser: 6 cases) were invalid or recurrence cases. Laser therapy was selected, particularly in cases where the lesion was large or conspicuous location or when the patient was of an advanced age. However judging from invalidity or recurrence, argon laser, Q-switched ruby laser, and Q-switched YAG

laser therapy were considered ineffective for treatment.

3) We searched literature for cases treated with laser therapy without the condition being diagnosed as LM. Six such cases were identified [10-14] (Table 3). As for the diagnosis made in these cases, there were 2 lentigo senilis cases, 1 benign lentigo case, 1 actinic keratosis case, and lack of foresight were 2 cases. When the cases were diagnosed as a malignant melanoma and a carbon dioxide laser was employed for treatment, there were no the recurrences; however, recurrence occurred when a wrong diagnosis was made and carbon dioxide laser treated was employed. Among these cases, 4 of

5 were reported after 2004; this increase in recent reports was attributed to the rapid spread of the laser technology and the trend of aesthetic dermatology.

Arlette *et al* [16] did not recommend laser treatment for LM because of the many recurrences, invalidity of this treatment for atypical melanocytes existing deep in the pilary complex and there was no control study. In the recent years, the opportunities for the applications of laser therapies for resolving pigmented spots on the face have increased with aesthetic dermatology. We determined that there was no relation between the laser therapy, which was performed 15 years ago in a previous clinic, and the recent recurrence of LM in this case. This report demonstrated that laser therapy should be carefully and judiciously used for pigmented spots.

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