Improvement of disfiguring skin conditions by laser therapy

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PORT-WINE STAIN PROGRESSION: IS PREVENTION BY PULSED DYE LASER THERAPY POSSIBLE?
ABSTRACT
Port-wine stains (PWS) are capillary malformations that are generally pink and flat at birth. Progression into purple, thickened and nodular PWS is part of the natural course. Although many experts assume that the development of hypertrophy can be stopped by adequate pulsed dye laser (PDL) therapy, good evidence is lacking.
We present three adult patients, who received only partial treatment of their port-wine stain. They all developed hypertrophy predominantly in the untreated part of their PWS. These observations provide circumstantial evidence that adequate treatment may delay or even prevent the progression of PWS.
We hypothesize that frequent PDL treatment with optimal individualized settings not only can attribute to blanching PWS but also can prevent or delay PWS hypertrophy in later life. Since age of onset of hypertrophy is reported to be around 30 years, we suggest treatment should start well before that age. Regular intermittent maintenance of treatment could attribute to the prevention of aesthetically and mechanically disturbing hypertrophy.
INTRODUCTION

Port-wine stains (PWS) are capillary malformations that are generally pink and flat at birth. Progression into purple, thickened and nodular PWS is part of the natural course.\textsuperscript{1,2} Seventy percent of patients over 50 years of age show PWS with hypertrophy.\textsuperscript{3} Although many experts assume that the development of hypertrophy can be inhibited by adequate pulsed dye laser (PDL) therapy, evidence is lacking.\textsuperscript{4} In this report, we present three adult patients, who received only partial treatment of their port-wine stain. They all developed hypertrophy predominantly in the untreated part of their PWS.

Patient 1, a 54-year old man, presented in 2009 with hypertrophy in a previously partially treated PWS on the right side of the neck and scalp. Between 1996 and 2004, he had received 23 treatments with the 585 nm PDL with moderate improvement of the colour of the lesion. The PWS located on the scalp was never treated. In the following 5 years without therapy, 1-2 mm large nodules arose in the previously treated part of the PWS on the neck, and bigger 5-15 mm large nodules appeared in the untreated part of the PWS.

Patient 2, a 64-year old woman, presented in 2008 with hypertrophy in a previously partially treated PWS on the right side of the face and the scalp. In childhood, the PWS had been treated with radiotherapy and with the argon laser. Between 1998 and 1999, she had received 2 treatments with the 585 nm PDL, and 2 with the 1064 nm Nd:YAG laser for some thickened parts of the PWS on the face. Between 2002 and 2004, another 5 treatments with the PDL and 2 treatments with the Nd:YAG laser were received. There was some improvement of colour and of thickening located on the ear and in the area around the nose. The part of the PWS located on the scalp was never treated. In the following 4 years without therapy, insignificant hypertrophy appeared in the face while larger nodules arose on the scalp.

Patient 3, a 60-year old woman, presented in 2006 with hypertrophy in a previously treated PWS on right side of the face and scalp. In childhood, the PWS had been treated with radiotherapy and with 5 sessions of argon laser. Between 1997 and 2004 she had received 27 treatments with the 585 nm PDL and 9 treatments with the Nd:YAG laser for some thickened parts of the PWS on the face. There was moderate improvement of colour and thickening. The PWS located on the scalp was never treated. In the following years without therapy, parts of the PWS became darker again and 5-10 mm large nodules arose in the PWS located on the scalp.

DISCUSSION

In the cases presented, we observed development of hypertrophy mainly in the untreated parts of the PWS. These observations provide circumstantial evidence that adequate treatment may delay or even prevent the progression of PWS. In all three patients, the untreated region was the scalp. In a previous study, we found that localization of the PWS was not associated with hypertrophy. Therefore, PWS on the scalp are not at higher risk to develop hypertrophy.\textsuperscript{3}

In the past, several treatment options for PWS were proposed with only moderate results.\textsuperscript{4}
We hypothesize that frequent PDL treatment with optimal individualized settings not only can attribute to blanching PWS but also can prevent or delay PWS hypertrophy in later life. However, as direct evidence is lacking, there is a need for future studies to investigate the effect of PDL on PWS progression. Previously, Huikeshoven et al. reported that redarkening of PWS occurs when PDL therapy is not maintained. Since age of onset of hypertrophy is reported to be around 30 years, we suggest treatment should start well before that age. Accordingly, early treatment at a macular stage has the objective of decreasing the size and quantity of vessels in order to decrease the progress to a more ecstatic state. Regular intermittent maintenance of treatment could attribute to the prevention of aesthetically and mechanically disturbing hypertrophy.

Figure 1. (a) Previously treated PWS in the neck with moderate improvement of colour. The non-treated part on the scalp shows darkening and large nodules. (b) Previously treated PWS on the right side of the face with moderate improvement of colour and hypertrophy. Larger nodules are visible in the non-treated part on the scalp. (c) Previously treated PWS on the right side of the face with moderate improvement of colour. Larger nodules and darkening is seen in the non-treated part on the scalp.
REFERENCES