

# Retraction of skin wounds after the removal of simple haemangiomas by ray of infrared laser

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## Abstract

The results of the observation of 280 children with simple forms of haemangiomas, which were removed by modulated ray CO<sub>2</sub>-laser are presented in the paper. It is shown that using the method of laser retraction existantly decrease the area of postoperative wound and diminish the period of curing.

**Key words:** modulated radiation of infrared laser, laser retraction, haemangiomas.

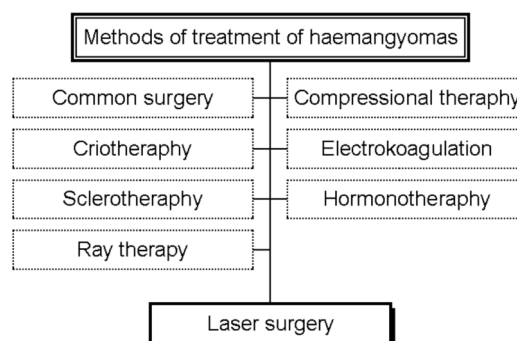
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## Introduction

Haemangiomas are the benign blood tumours [1,2]. In our opinion the morphology of these tumours do not possess displastic nature of haemangiomas. About 80% of tumours in childhood are haemangiomas. In general haemangiomas is observed in 1.1~2.6% of all children and this index increases to 10% during first year of life [1]. In connection with such a wide spreading of angyomas, and the danger of serious complications, optimization of traditional methods of the treatment become quite important.

There are many methods of treatment of haemangiomas (Table 1) [3-5]. To these methods also belong laser surgery of haemangiomas. But in connection with the absence of data about the tumour morphology, tumour spreading as well as surgically unprofitable localization and anatomy–physiological peculiarities a child's organism it is difficult to create a maxi-

**Table 1.** Methods of treatment of haemangiomas.



mal effective method of laser surgery of haemangiomas.

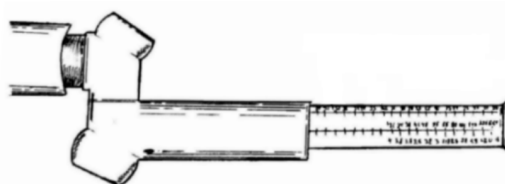
There are 280 patients in the clinic of the Republic Clinical Children's Hospital with simple forms of haemangiomas with different localization and spreading. These patient were operated by commercially available equipment "Scalpel-1" designed on the base of a modulated low-intensive infrared laser with a wavelength 10.6μm.

## Experimental and results

For treatment of skin forms of haemangiomas we used “soft” laser radiation with the power 5~10W. After processing the haemangiomas by antiseptic and after local anesthesia, we used the method of laser ray scanning. As a result of treatment we observed the coagulation and destruction of haemangiomas tissue. During the destruction of the haemangiomas, tumour waster parts are removed by a wet napkin. The laser coagulation is conducted within the limit of visible haemangiomas. Simultaneously, the homeostasis of the operated area was provided. After the destruction of all the tumour and removal of the waster parts, the surface of the skin is bared. The farther exposition leads to intensive contraction of this area. The observed effect of the contraction of the wound area suggests the advantage of using laser retraction (Fig. 1,2).

As the result of removing simple subdermal forms of haemangiomas from a wide area ( $3\sim 4\text{cm}^2$ ) a considerable wound defect appeared. The cicatrix of this wound is durable and demands transplantation of the skin (autoplastic). In this case the infectional complications and cosmetical defects can appear. This circumstance leads to searching for ways of decreasing the area of the postoperative wound on the base of laser retraction. The area of haemangiomas varies from 1.1 to  $2.5\text{cm}^2$ . We have made the laser retraction of postoperated wounds in the experimental group.

For providing maximal laser retraction we used a graduated telescope laser tip (Fig. 3). This tip permits to set the parameters of infrared radiation with a high degree of accuracy and provides the reproducing result of treatment. The surface of the postoperative wound is processed during 10~15seconds by an infrared laser ray with a diameter 2~2.5cm and power 10W. The area of the wound is determined by a special network.



**Fig. 3.** Graduated telescope laser tip

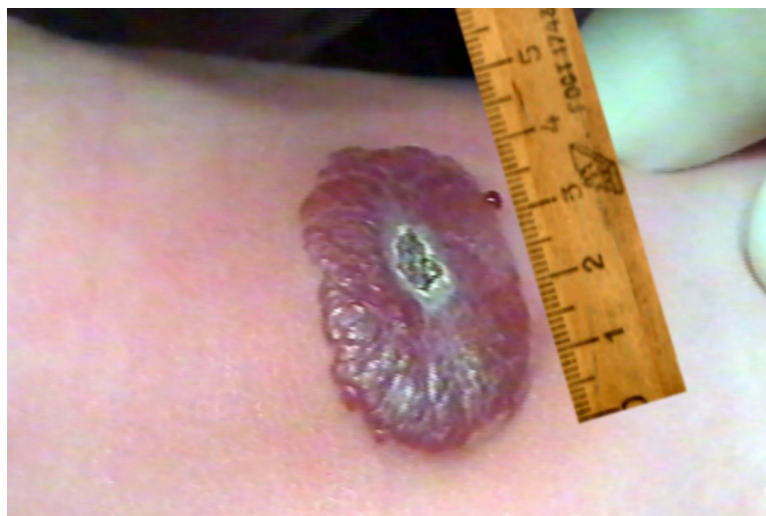
In separated cases in both groups of children the duration of the closing of the wound and appearing of cosmetical defects is determined (Table 2). Compression of appeared cosmetical defects in control and experimental group is shown in the Table 3.

## Conclusions

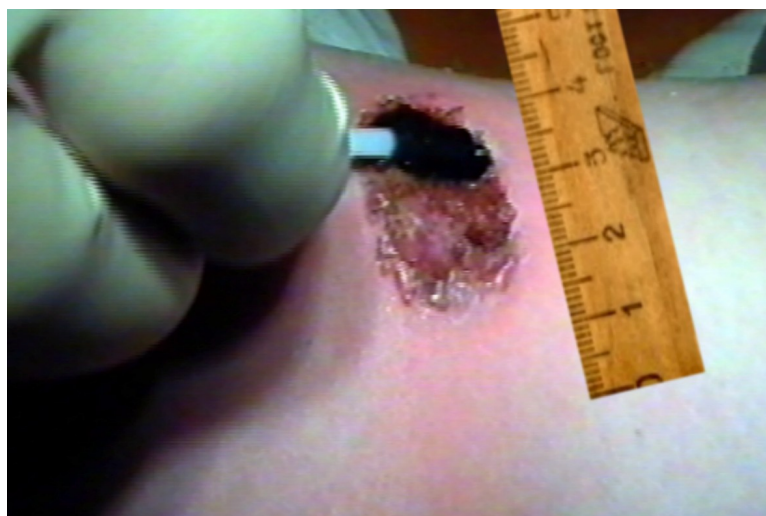
From the results of investigation we can conclude that application of the method of laser retraction leads to the decreasing of the area of the postoperative wound, and this method accelerates the processes of closing and reduces the probability of infectional complications and cosmetical defects. The advantages of the proposed method of treatment of skin forms of

**Table 2.** Compression of the experimental and control group.

Localization	Children in control group	Children in experimental group	Percent of the contracting surface	Period of closing in control group (days)	Period of closing in experimental group (days)
Legs and feet	30	30	40~45%	11	9
Arms and hands	35	35	45~50%	9	7
Anterior abdominal wall	30	30	48~52%	9	8
Skin of the face	45	45	45~50%	7	6
Total children	140	140			



**Figure 1.** Haemangioma before laser retraction.



**Figure 2.** Haemangioma after laser retraction.

**Table 3.** Percent of cosmetical defects in control and experimental group.

	Control group	Experimental group
Percent of cosmetical defects	4,29%	2,14%

simple haemangiomas by the ray of infrared laser are shown.

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