

NEW TREATMENT FOR BIRTHMARKS

An instrument designed by engineers of the National Research Council of Canada is now being used by a Toronto plastic surgeon, in a program of experimental surgery that holds out new hope for those born with port-wine stain birthmarks.

The method, which was pioneered in the 1940s by a New York surgeon, Dr. Herbert Conway, resembles tattooing. It involves injection of pigments — primarily whites and greens — to combine with the reds of the stain to form a color-tone that, ideally, would blend perfectly into normal skin surrounding the stain area.

In 1960, this procedure had fallen into disrepute and was all but abandoned by plastic surgeons in North America, when Dr. H.G. Thomson of Toronto began to work on the refinement of the technique.

METHOD STILL NOT PERFECT

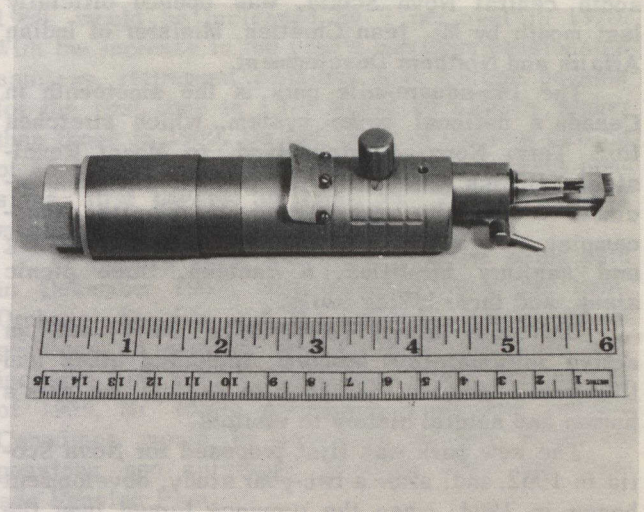
Unfortunately, the method does not solve three major problems: how to insert an adequate volume of pigment at the time of operation; how to prevent leaching away of the pigment particles; and how to obtain a color match of the pigment to the patient.

Five years ago, the first of 70 children was treated in a research program at the Hospital for Sick Children in Toronto. Work started with the original cable-driven Dermajector and then continued with a regular tattoo artist's machine.

It was established that small punctures permitted more pigment to be inserted than large ones, with less associated burning, dermis loss and external loss of pigment. It was also found that the higher the frequency of injection, the greater was



Demonstrated use of the new machine for treatment of the port-wine birthmark.



Close-up of the six-inch instrument currently being used in experimental surgery to remove the port-wine stain birthmark.

the amount of pigment inserted, giving the advantage of being able to inject a large amount of pigment before profuse bleeding started.

NRC EXPERIMENTS

This finding led to adaption of a high-speed air turbine motor to provide the desired high frequency of puncture. Initial designs were plagued with troubles and, in 1967, the project was turned over to S.H.G. Connock, head of the Instruments Section in NRC's Division of Mechanical Engineering.

Three prototype instruments were developed, the latest providing for combinations of 10, 20 and 26 needles held in "needle carriers". The operating frequency of the needles is about 20,000 to 22,000 cycles a minute.

The needles have an adjustable depth of penetration from zero to three millimetres. A "foot" on the instrument, which rests on the skin, controls the depth of penetration and also positions the needle carrier correctly in relation to the skin surface.

Dr. Thomson has turned over a duplicate instrument to Dr. Robert Newton, also a plastic surgeon, who has treated a total of 13 adult patients at the Toronto General Hospital. "We can now insert the pigment without difficulty," says Dr. Thomson. "And while the results of pigment insertion are excellent, that is not synonymous with clinical results being excellent. An evaluation panel has been invited to assess the results of our clinical work. This has been done to provide us with an impartial critical evaluation of the degree of patient improvement."