New type of needle for obtaining large samples of human adipose tissue

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SUMMARY A new type of needle for obtaining human fatty tissue samples is described. With this instrument 350–600 mg of tissue may be obtained less traumatically than with previously described instruments.

KEY WORDS biopsy needle · adipose tissue · human

IN THE COURSE of the investigation of the metabolism of fatty tissue, it is often necessary to obtain samples of tissue from human beings in amounts large enough for biochemical investigation and repeatedly from the same subject. Various methods of doing this have been devised, such as aspirating syringes (1–3), cut downs (4), and excisions during surgical operations. The samples obtained by the aid of aspirating syringes are usually small. We have devised a needle which allows fairly large amounts of tissue to be obtained.

Description of the Needle. (Figs. 1, 2.) The instrument (manufactured by E. Rey Workshop, 28 Najara St., Jerusalem) is made of stainless steel and consists of an inner, partially hollowed trocar and an outer blunt cannula. The trocar fits snugly into the cannula and has a sharp closed perforating point which protrudes 9.5 mm beyond the blunt extremity of the cannula. The bases of the cannula and trocar fit together to form a heavy handle which provides a good grip. The cannula and trocar have a longitudinal opening on one side, which occupies about a fourth of their circumference. The two openings are of the same length and, when positioned for cutting, fit one another in such a manner as to admit the tissue into the hollow excavation of the inner trocar. The lateral edges of the openings are sharp and honed, and they fit closely together so as to cut the fatty tissue. The tissue is aspirated into the hollow by suction by means of a syringe fitted into the luer-lock adaptor at the upper end of the trocar. Detailed measurements of the components are shown in Fig. 1.

Method of Biopsy. Most of our biopsies were made on the subcutaneous tissue of the abdominal wall. The skin over the tissue for biopsy is sterilized with 70% alcohol. No antiseptic is used, because it could contaminate the tissue and inhibit enzymes. The skin is then anesthetized with intracutaneous lignocain. A very small incision is made with a pointed scalpel and the biopsy needle is

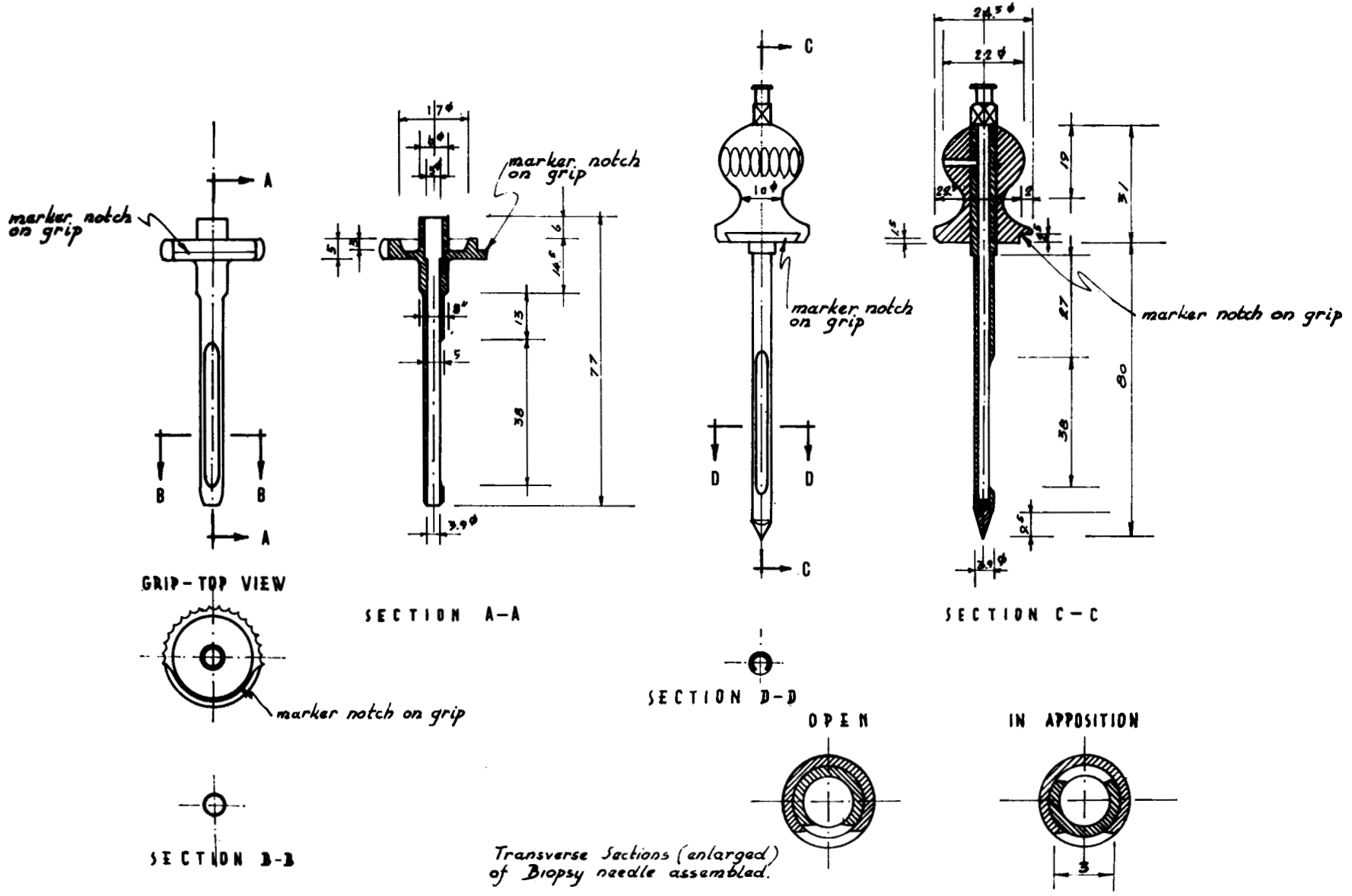

FIG. 1. Specifications of instrument (measurements in millimeters). From left to right, outer cannula, view; outer cannula, section; inner trocar, view; and inner trocar, section.

introduced for its entire length up to its base. In order not to penetrate the abdominal cavity or deeper tissues, we introduce the needle parallel to the skin surface. During this stage, the openings of the trocar and cannula are in apposition, and together they thus form a closed needle, which is indicated by notches on the grip. After the whole instrument has been introduced up to the grip, the trocar is rotated so that the two openings coincide. Light suction

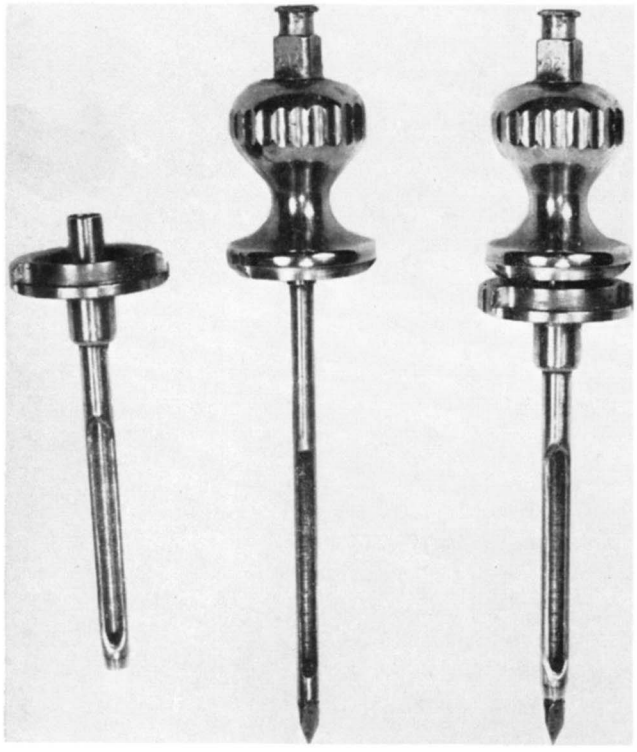

FIG. 2. Photograph of instrument. From left to right, outer cannula, inner trocar, and assembled needle.

is applied via the 10 ml syringe fitted to the luer-lock adaptor; the piston is pulled back 2–3 ml and the inner trocar is simultaneously rotated until the openings are again in apposition. The trocar only is then withdrawn, the cannula being left in place. The small cylinder of fat (up to 3 cm in length) found in the cavity of the trocar is removed. The trocar may be repeatedly reintroduced into the stationary cannula if a larger amount of fat is required.

We have carried out about 100 biopsies to date. From a single biopsy site, 350–600 mg of fat have been obtained without difficulty. Providing the cutting edges are kept sharp, bleeding is generally slight, especially with the first sample. Bleeding is more common with repeated aspirations; but only the surface of the sample is then contaminated. In such a case, the blood can easily be removed by immediate rinsing.

The fat cylinders are obtained with a minimum of trauma, since they are in fact excised from the surrounding fat. This method thus has the advantage of convenience with minimal trauma.

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