

KRUKENBERG'S CINEPLASTIC
OPERATION: EXPERIENCE
FROM 42 CASES, WITH FILM SHOW

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Krukenberg's operation, which aims to make a forceps-like hand from a forearm stump, giving a gripping organ with sensation, to be used as it is, without a prosthesis, completes this year its 30th year. But until recently it has been regarded very sceptically: in the literature I have not been able to find more than 84 cases. However, time has worked in its favour, for now amputation of the upper limb with a prosthesis is not considered of great value. During the second world war the operation was used without hesitation in Russia (N. Priorov) and in Germany, where due to Kreuz's influence it was the method of choice, as I saw myself when I was sent there on military orthopedic service. In America the method has not gained a footing, but, judging from the International Orthopedic Congress held in Brussels last autumn, it has at last been approved in Europe.

Since the method seems now to be having a revival, I have decided to publish a detailed account of the results of 42 cases in which I have myself done the operation, and I should like to present the following conclusions drawn from these cases:

1. The skin incision should be made so that the scar does not lie on the contact surfaces of the forceps.

Read at the meeting of the *Nordisk Ortopedisk Forening*, June 1947, Stockholm.

2. The pedicle flap, which is taken from the abdomen to cover the outer surface of the ulnar stump, should be made a bit narrower towards its base, so that the abdominal skin defect can be closed by primary suture.
3. The muscles must not be removed, since their removal impairs the blood supply. A Krukenberg stump is anyway more sensitive to cold than an ordinary stump.
4. The forceps hand must be exercised as soon as the sutures are removed, and the exercises should be continued under the surgeon's supervision until satisfactory function is obtained.
5. When judging the value of the Krukenberg operation, one must judge a successful pincer hand in a suitable patient.
6. A successful pincer hand has good proportions, the best possible sensation and circulation, an opening angle of 30-45°, a straight hinge-like ab- and adduction movement with both flexion and extension of the stump, good gripping power (5-10 kg.) and a rapidity of movement approximating to the dexterity of fingers (100-190 per min.).
7. Suitable patients, in addition to all double amputees and blind persons, are also those in whom one forearm has been amputated and the other hand severely damaged.
8. The method has the following disadvantages:
 - a) the appearance of the forceps hand is not pleasant,
 - b) the operation is time-consuming and the training period is long,
 - c) the blood supply of the stump may be impaired and the sensibility of the ulnar side of the stump reduced,
 - d) a long stump has to be shortened.
9. Since a unilateral amputee can manage well with one hand, one must consider the disadvantages of the operation, thoroughly know the patient, and consider carefully whether it is worth doing the operation. To a person who has lost his right hand, a pincer hand can be of some help, but it is not worth doing a Krukenberg

operation on a man who has lost his left or worse hand, since experience has shown that he will not use it. The film presented attempts to illustrate the subject.

SUMMARY

The author has done 42 Krukenberg's cineplastic operations. He stresses some important points concerning indications and technique.

RESUME

L'auteur a pratiqué 42 opérations cinéplastiques de Krukenberg. Il relève quelques points importants par rapport aux indications et à la technique.

ZUSAMMENFASSUNG

Verfasser hat 42 Krukenberg'sche kineplastische Operationen ausgeführt. Er hebt einige wichtige Punkte betreffend Indikationen und Technik hervor.