

UNUSUAL ANOMALIES IN THE UPPER EXTREMITY

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The problem in prosthetic fitting of the upper extremity anomaly is to obtain prehension with mobility, strength, agility, skill, cosmesis, and, if possible, at the same time to retain tactile sensation. Each patient presents a special situation of his own. The main goals should be increased function and continued usage. To obtain this potential requires not only the utmost cooperation of the patient, but of all members of the prosthetic team. Continued experience and experimentation with these patients may modify the prosthetic prescriptions; the goals, however, should remain the same.

Case I, born May 2, 1954, presented bilateral hemimelia (knee disarticulations), right upper partial hemimelia (very short below-elbow), and left upper partial adactylia (ulnar). She was admitted to the Area Child Amputee Program at the age of thirty-two months. Initially her lower extremities were fitted with lightweight wooden sockets, aluminum double uprights, SACH feet and toddler's harness; shortly thereafter, the sockets were changed from wood to plastic. Her present prescription consists of standard knee disarticulation prostheses with SACH feet and toddler's harness. The prescription written for the right upper extremity was a split socket type of prosthesis with Dorrance 10X terminal device and single-control harness system. The left upper extremity revealed a one-finger hand with good wrist motors, but without active motion of the digit. Tendon graft procedures were done to extend the motor power from the wrist muscles to the finger. A partial prosthesis was then used to obtain prehension. This was a simple opposition post attached to a forearm cuff. The patient rapidly obtained bilateral prehensile activity, with a tendency to favor the partial prosthesis because of the tactile sensation present in the finger. This child is now five and one-half years of age; she is living with foster parents and attends kindergarten. She has made an excellent adjustment to her home situation. She is now able to dress herself, including applying her prosthetic appliances without assistance. This case demonstrates the desirability of applying partial prostheses wherever possible, retaining tactile sensation as well as obtaining prehension. (See Figures 1, 2 and 3.)

Case II, born December 18, 1939, was born with bilateral upper amelia (shoulder disarticulations). He was admitted to this Center at the age of seventeen years. At the age of twelve he had a right pectoral cineplasty which, he felt, did not meet his needs in improving prosthetic function. He was not wearing his prostheses when first seen here. In February 1957 this patient was fitted with a ball-and-socket shoulder unit on the right side, and a Hosmer 200 elbow with locking accomplished by the pectoral cineplasty. On the left he had a standard shoulder cap with a Hosmer 200 elbow which was operated by nudge control. (See Figure 4.) He was fitted with a bilateral pulley system to functionalize the terminal devices. In January 1958 the patient desired a perineal strap to operate the right elbow. He later requested that the pectoral cineplasty tunnel be

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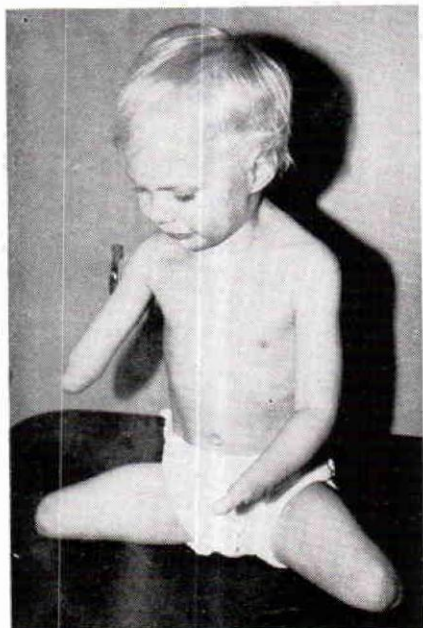


Fig. 1. Patient, thirty-two months of age, presents congenital bilateral lower hemimelia, right upper partial hemimelia and left partial adactylia.



Fig. 2. During early training period: she is fitted with a short below-elbow type of prosthesis on the right and a partial restoration prosthesis on the left. She favors the partial restoration because of the tactile sensation present in the finger.



Fig. 3. Partial prosthesis allows sensation and, with the tendon graft procedure, strong prehension. Patient has been fitted with standard knee disarticulation prostheses; she is able to walk independently.

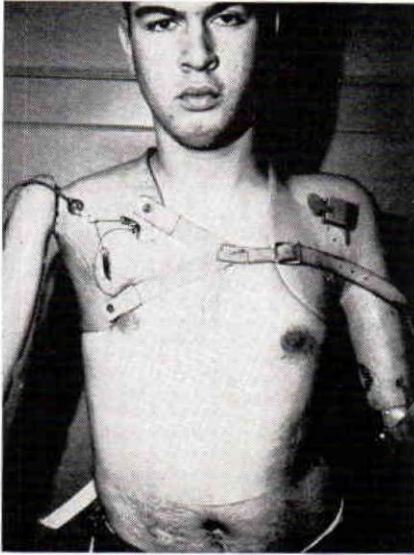


Fig. 4. Original prosthetic fitting included ball-and-socket shoulder unit on right, with elbow-locking accomplished by pectoral cineplasty; on the left he had a standard shoulder cap, with elbow operated by nudge control.



Fig. 5. Patient demonstrates excellent prehensile activity with his toes, and he is able to apply his prostheses independently.



Fig. 6. This shoulder mechanism was designed by Colin A. McLaurin, Northwestern University Prosthetics Research Center. It is a multi-positioned shoulder with a spring detent lock. This mechanism allows a patient with bilateral shoulder disarticulations a greater range of terminal device positioning with positive locking.

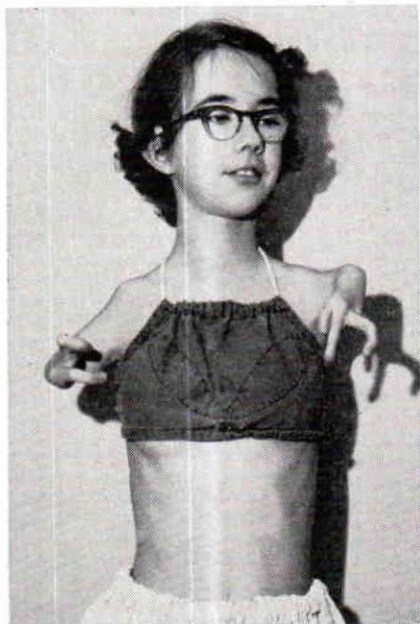


Fig. 7. This patient has a clinical diagnosis of bilateral phocomelia, upper extremities. Because of the extreme shortness of her arms, the patient was forced to move close to her work.



Fig. 8. Prostheses enable patient to operate at normal arms' distance from the body. The shoulder caps with open humeral sections allow activation of the elbow locks with patient's anomalous fingers.



Fig. 9. Patient prefers to wear only the right prosthesis for everyday functional activities.

eliminated because it was a constant problem to keep clean and non-odorous. In June 1958 this was done. Previously he had been doing farm work, and he was able to drive a tractor with his feet. He had excellent prehensile activity with his toes and was able to apply his prostheses using his feet. (See Figure 5.) After he had been trained in the use of his prostheses, his range of activities increased tremendously. He was able to clothe himself with a minimum of assistance; he could write legibly, open doors, smoke, play cards, checkers, etc.; he was able to handle all details of toilet care without assistance. Further, he was able to use a dial telephone, although he could not use a pay-phone because of the height of the coin slots. (See also Figure 6.)

Case III, born June 24, 1945, has a clinical diagnosis of bilateral phocomelia, upper extremities. She was first seen in this clinic at thirteen and one-half years of age. She had never been fitted with prostheses. (See Figure 7.) Because of the extreme shortness of her arms, the patient was forced to move close to her work. She was very desirous of obtaining prehension at normal arms' length. She was fitted with shoulder caps with open sections to allow activation of the elbow locks with her anomalous fingers. (See Figure 8.) She was harnessed so that she could wear either bilateral prostheses or the right prosthesis could be worn alone. (See Figure 9.) Because she was not fitted until her fourteenth year, she was slow in responding to prosthetic training; however, she was pleased with the increased range of activity for prehension and the increased strength obtained. She eventually decided to wear only the right upper extremity prosthesis for functional activities. She wears both appliances on social occasions for more satisfactory cosmesis.

Recognition is given to members of the prosthetic team for their helpful assistance in the preparation of this article.

BINDING THE JOURNAL

Headquarters is now negotiating with a Chicago firm about a definite and official binding for various issues of our *Journal*. Howard Reinherz of Kenosha, member of the Journal Advertising and Supply Committees, is talking with the bindery service to see if we cannot arrive at a good arrangement whereby readers can

have their issues bound immediately at the end of the year.

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