# THE CONGENITAL AMPUTEE

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The problems presented by the congenital amputee are distinct from, and more complex than, those presented by the traumatic amputee. The psychological problems will usually be more severe and more ingenuity is usually required in fitting these patients with prostheses. Surgery may be indicated for some of these cases, but it will be of a different type than that performed on the traumatic amputee. Selection of a vocational objective for these people, as they approach adulthood, will involve specific career planning rather than adjustment for the patient's return to his previous work, as is the case with patients who have become amputees after reaching maturity.

The etiology of these congenital amputations is still unknown; it is believed to be a biological "sport" for which neither parent can in any way be blamed. Nevertheless, persons working with the congenital amputee will find, in the parents, a persistence of guilt feeling and superstititions which can be extremely damaging to the patient himself.

The incidence of all types of congenital abnormalities is 68 per 10,000 live births and 297 per 10,000 stillbirths, according to Murphy.* His figures show, also, that the birth immediately following that of the defective child is less likely to be abnormal than is the third birth in the series. He summarizes the statistical evidence as follows:

1. Approximately one child in two hundred presents some type of congenital defect.

2. The likelihood of a malformed birth is increased among parents who have already had one defective child.

3. Malformations occur more often among the white race than among Negroes.

4. As the age of the parents increases, so does the possibility that they will have a malformed child.

5. However, a difference in the ages of the parents has no statistical relationship to the incidence of congenital malformations.

6. No evidence can be found for believing that frequency of reproduction influences the birth of a malformed child.

7. However, with the fifth child born in a family with one defective child, a significant and progressive increase in the birth of malformed children is observed.

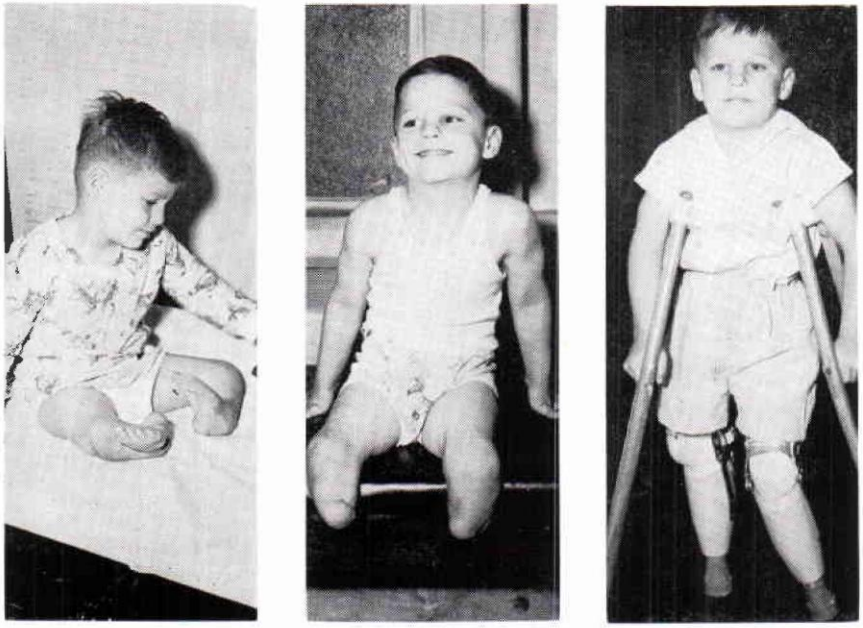
8. Malformed children are more apt to be born prematurely.

9. Between the birth of one defective child and another to the same parents, a normal birth is likely to occur.

10. There is an increased incidence of natal accidents immediately before and immediately after the birth of a malformed child.

11. The birth of a malformed child is more often preceeded by a period of relative sterility than are the births of the normal siblings.

*Murphy, Douglas P.: Proceedings Kessler Institute for Rehabilitation; 1:2; 1953.



1a 1b 1c

Fig. 1a: Bilateral congenital lower extremity malformation. Fig. 1b: Same patient, after surgery. Fig. 1c: Same patient, fitted with primary below knee prostheses.

12. The use of contraception appears to have no influence on the subsequent birth of malformed children.

13. No one season of the year is associated with an increased frequency of malformed birth.

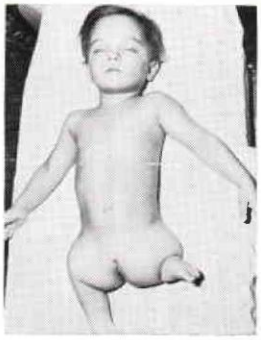
14. No unusual occurrence of placenta previa is observed among defective births.

15. Certain types of congenital malformations are observed more frequently among one sex.

16. When there is more than one malformed child in a family, the chances are one in two that the defect will be duplicated in the subsequent malformed birth.

The obstetrician who delivers a seriously malformed child must prepare himself for a severe reaction from the parents, and be able to render some assistance and reassurance to them. The pediatrician responsible for the child's welfare will determine the nature and extent of the physical limitation to be expected, and recommend suitable procedures. Surgery is indicated for some defects; for the congenital amputee, prosthetic appliances and training is the indicated procedure. Often, a demonstration of competence by an adult amputee will do much to reassure the parents and encourage them to seek rehabilitation for their child.

Surgery for the congenital amputee usually involves the removal of superfluous structure which would interfere with prosthetic fitting. A short below elbow stump is common among congenital upper extremity amputees; rarely, finger "buds" are removed surgically to enable the stump to accept a prosthesis. If the stump is extremely short, or if there is a congenital shoulder disarticulation, the surgical technic of cineplasty may be required to provide upper extremity function. Appendages, sometimes found at the end of the stumps of lower extremity amputees, are usually



2a

2b

2c

Fig. 2a: Bilateral congenital malformation of lower extremities and hip. Fig. 2b: Same patient, after surgery. Fig. 2c: Same patient, fitted with primary hip disarticulation pylon prosthesis.

removed to facilitate the fitting of a prosthesis.

During the past ten years, a trend toward increasing specialization has been observable among prosthetic firms. Nearly all of them have distinct departments for the upper and lower extremity and there is a good deal of further specialization within these categories. One New York firm, for example, has become so proficient with hip disarticulation prostheses that 80% of its work is now concerned with amputees requiring this type of limb. The congenital amputee child benefits from this increasing specialization since some firms will be especially well prepared to deal with his particular problems.

In 1952 the National Research Council's Committee on Artificial Limbs established, in cooperation with the University of California at Los Angeles, a special school for prosthetists, physicians and therapists to provide special instruction in upper extremity prosthetics. Refinement in the use of plastics for prosthetic devices has led to great improvements during recent years. Technics developed in the military services and by the Veterans Administration are being made available to commercial firms, resulting in an increasingly higher level of service which these firms are able to provide.

Plastic laminated sockets, the use of which is relatively recent, are especially desirable for children. They are lighter in weight and the ease of keeping them clean is a special advantage for young patients.

There still exists a great need for parts properly sized for use by child amputees. There are relatively few amputee children and fewer firms which do much work for them; hence, there is little demand for parts and consequently they have not been manufactured in quantity. When they were needed, local prosthetists generally hand-made the parts. However, orthopedists now realize the necessity of fitting amputee children very early in life, and prosthetists can expect an increasing demand for children's prostheses. The lower extremity congenital amputee will often be fitted before he is a year old, so that he may become proficient in the use of his prosthesis as he matures. Prosthetists will face special problems in fitting very young children and should be alerted, therefore, to the fact that their standard technics may require revision in these cases.

Jerome S. Kessler, C.P., was born in Newark in 1924. Before entering the prosthetics field, he studied for two years at the Newark College of Engineering. Mr. Kessler received his professional training at the Winkley Artificial Limb Company, Minneapolis; the Minneapolis Artificial Limb Company; the United States Naval Hospital at Mare Island, California; and the Suction Socket School, Milwaukee.

During 1951 he studied at the Ministry of Pensions Hospital at Roehampton, England, and then toured Sweden, Denmark, Germany, Austria, Switzerland, Italy and France, observing European prosthetic technics. Returning to the United States, he continued his studies at the Henzel Artificial Limb Corporation in New York and returned to the Minneapolis Artificial Limb Company.

Mr. Kessler was certified in 1952, following which he became President of Kessler Associates in Newark, manufacturers of prosthetic appliances. He is married and lives in Cranford, New Jersey.

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The problem of growth is not as serious as one might suppose. For example, hip disarticulation prostheses can be made to fit very well for several years. When the socket contains a lining of felt, one-half inch in thickness, part or all of the liner can be removed if the socket becomes too small. A prosthetist can therefore guarantee the usefulness, for at least two years, of a prosthesis of this type. Aside from lengthening the shin and routine adjustments, no major revisions of the prosthesis will be required. Further, one may make the thigh section an inch longer than is required and the shin section an inch shorter. By using an ankle joint with long stems at the top, a series of half-inch blocks can be inserted at the ankle to progressively lengthen the leg. Above-knee limbs are usually routine except in cases presenting a dislocated hip or congenital absence of the head of the femur. In these cases, hip and knee locks can be added. Wooden sockets are satisfactory unless an odd shape is necessary; in these cases, a plastic socket is molded from a plaster cast of the stump. For older children, a wooden socket, conforming to the shape of the stump, is excellent; weightbearing is in the region of the gluteal muscles and especially at the ischial tuberosity. Below-knee limbs are made with leather sockets and shins somewhat larger than usual. The socket collar is made larger than usual so that new sockets can be made to fit the original shin. Again, progressively increasing length is obtained at the ankle joint.