

## DEMONSTRATION OF SURGICAL RESULTS IN INFANTILE PARALYSIS OF THE LOWER EXTREMITIES

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Mrs. La Du, Superintendents of State Institutions, Ladies and Gentlemen:

I will not take up much more of your time, but before we leave the subject of infantile paralysis there are a few cases of paralysis of the lower extremities showing the results of surgical treatment which I would like to show you.

Unfortunately all cases of infantile paralysis are not treated as well as those you have been shown today, and we admit a number of patients who have had paralysis in the past and have developed a certain amount of deformity in the lower extremities which must be corrected before we can proceed with the other treatment. For example, if a child develops a very bad case of knock-knee, as many do who have had an extensive paralysis of the leg, one of these long braces which you have been shown cannot be applied to the leg until it has been straightened by operative procedure. The same is true of any other well developed bony deformity. Operative procedure in these cases is very simple, and consists briefly of cutting the bone across where it is deformed, and dressing it in a straight position and allowing it to heal in this corrected position.

It is our aim in residual paralysis to get away from mechanical appliances, if possible, and to get a stabilization of the extremities so that heavy mechanical aids need not be worn, or so that the type worn may be simplified. There are many different types of operation which are undertaken for paralysis in the lower extremities, and a few of the more standardized principles of procedure will be reviewed briefly. A properly planned operation makes some of these children practically normal so far as function is concerned.

**Tendon Transplantation.** We sometimes resort to what is known as tendon transplantation. This is the substitution of a healthy tendon or muscle for one which has been paralyzed, the transplanted muscle replacing in part at least the function of the paralyzed muscle, and thus tending to balance the part.

**Tenodesis.** Occasionally we stabilize extremities by using the tendons of paralyzed muscles as ligaments, the so-called tendon-fixation or tenodesis. The tendon is inserted in the bone in such a way as to counteract the deformity and is fastened in this position.

**Arthrodesis.** The operation done more commonly than any other in the lower extremities is arthrodesis or joint fixation, a procedure where we take unstable joints and stabilize them by destroying them and making them stiff.

We can reinforce that operation in the foot by transplanting any sound tendons that may be left either to the front or to the back,

depending upon where we need the power. We can also reinforce the operation by placing a block of bone on the back of the heel which prevents the foot from dropping.

### Demonstration of Cases

**Case I.** A girl with paralysis developed in 1925 who has had osteotomies for correction of knock-knees and bilateral subastragalar arthrodeses and bone blocks at various times since. On account of the extreme paralysis, braces are worn to support the knees, and crutches are necessary for walking.

A person with complete paralysis of everything below the knee can get along with very little disability after having had a stabilizing operation on the foot, but with the knee involved she must wear a long leg brace or have the knee stiffened by surgery. Individuals must determine for themselves whether they want to wear a brace the rest of their lives or whether they prefer to have the knee stiffened and walk around without any appliance.

**Case II.** An older girl who had paralysis involving both lower extremities in 1916. She has had supportive and mechanical treatment in the past, and came into this hospital again in 1931 for stabilization of the feet. An arthrodesis and bone block operation was performed on the right, and on the left the arthrodesis was reinforced by a tendon transplantation.

Another operation which was done in December, 1931, was the transplanting of the biceps muscles to the kneecap for paralysis of the extensor muscles of the thigh, so that the power which is not so necessary behind is transferred to the front of the knee. You will see the importance of muscle training in infantile paralysis when you realize that merely by education we can get a muscle to straighten whose original function was to bend.

**Case III.** This girl is eighteen and has a residual paralysis involving the lower extremities dating from three years of age.

She has had correction of the deformities of her feet by lengthening of the heel cords and both legs have been straightened by cutting the bones and setting them in proper alignment. Tendon transplantation was done in the left foot and you can see the tendon coming across the front of the ankle and pulling the foot up. On the right the biceps muscle of the thigh was transplanted to the kneecap, and now the leg can almost be held against gravity although the operation was less than three months ago.

**Case IV.** Here is a girl who has had her leg lengthened. There is one thing which always happens in severe cases of infantile paralysis, and that is that due to certain disturbances a leg that is paralyzed does not grow as rapidly as a normal leg and, therefore, it is comparatively shorter as time goes on. If both sides are paralyzed, the legs stay about equal. On account of the fact that some of these legs become so very short, we do one of three things:

1. We either build up the shoe to make up for the shortening; or
2. We can shorten the normal leg by taking some of the bone out of it; or
3. We lengthen the paralyzed leg.

A leg can be lengthened so that we gain at least two and one-half inches additional in length by means of a special operation. This girl has had this done and the bone is now solid although we are not allowing it to go without protection. So far as her knee joint is concerned, she needs support, and we have a long brace with a well fitting cuff around the site where the lengthening took place.

Case V. This girl, now seventeen, had infantile paralysis when she was about five months old. She has had various treatments during the past years consisting of stabilization of both feet, straightening of the left leg and transplantation of the biceps to the front of the knee. On account of involvement of the trunk a leather body jacket is worn.

See what she does. She is walking fairly well, and, due to the biceps muscle being transplanted to the front of the knee, she has good power of active extension.

Case VI. This girl had paralysis in 1921. In 1929 she had a stabilization of both feet with transplantation of the lateral muscles to the front of the foot.

Later she had transplantation of the biceps to the kneecap on the left. She now straightens that knee with a flexor muscle, and the function of both lower extremities is excellent, as you can see.

Case VII. This girl is ten years of age. She had paralysis in 1924 involving both lower extremities.

She has had a stabilization and bone block on the left foot, and a stabilization with transplantation of the peroneus longus muscle to the front of the foot on the right. The transplanted tendon is working strongly.

Here are feet which would ordinarily roll from side to side. They are now stable, they will stay in a straight position and allow excellent function.

Mrs. La Du: Thank you, Dr. Cole.

On behalf of everyone in the audience, I want to thank Dr. Chatterton and the members of his staff who have given of their busy days, and we know how busy they are, to present the various phases of their work. They have given us a demonstration of the care and treatment and the results which are obtained through their efforts with the children here in the hospital. They sometimes tell us that "miracles are no more," but we don't care whether you call them miracles or the workings of modern science, after what we have seen this morning, and being familiar with many of the cases so completely cured that they go out from this hospital in a normal condition, we know that there are present-day miracles.

You may be interested to know that we have 244 children in the hospital today. There are from 150 to 200 on the waiting list at the present time. The longer those children wait, the more difficult it is for the surgeons to get the desired results, so it is to be hoped that, through this hospital and other hospitals for the care of crippled children, these children can have this splendid service at the earliest possible date.

We are going to adjourn for luncheon, and after luncheon we are going to have a demonstration of physiotherapy given by the physiotherapists of the hospital.

1. Principles of Muscle Testing by Miss Denny.
2. The Use of Various Types of Heat and Massage by Miss Glasgow.
3. Muscle Training by Miss Smith.
4. Hydrotherapy by Miss Adams.

After luncheon we will continue our program here and will then go to the various rooms to observe demonstrations in physiotherapy.

#### AFTERNOON

Mrs. La Du: After attending the wonderful clinic this morning, one almost feels that just do this, that, and the other thing, and bones are straightened and everything easily righted. This afternoon we are going to be shown that it is only after long and careful effort on the part of the physiotherapists that many of the splendid results are secured by the physicians. The necessity of patient, scientific treatment by the physiotherapists will now be demonstrated.

Our first demonstration on the theory of muscle training will be given by Miss Denny.