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TREATMENT OF OLD CASES OF HIP DISEASE.*

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On the streets of any of our larger cities one will see many examples of cripples walking with one limb either dangling in the air worse than useless, due to the extreme flexion at the hip with adduction, or else they will be seen walking very imperfectly on a high built-up shoe. It is the treatment of these cases and also that of convalescent hip disease to which I wish to call your attention.

There is no doubt that if convalescent cases of hip disease were carefully and persistently treated during the long period to complete recovery, whatever deformity had existed up to this time, and that which accompanies this period, could be entirely overcome without operation. During the convalescent period, the spasm of muscles having entirely disappeared, traction is not considered necessary—a brace that simply gives protection to the joint in walking is sufficient. This protection from jar in walking is especially required in the first part of the step, *i. e.*, at the time when the heel is brought to the ground.

This can be easily accomplished by using the caliper, the upper part of which is similar to the ordinary hip brace with stem, pelvic band and perineals, the lower part cylindrical in shape, turned at right angles to the stem and passing through a hollow cylinder in the heel. The stem and perineals should be of such length that the heel of patient, though inside the shoe, should bear no weight, all weight being taken up by perineals.

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The brace may be jointed at the knee, and the patient can then get about quite easily and with comfort. In small children the joint is unnecessary, and in clinical patients the question of additional expense debars the joint. Dr. A. B. Judson, of New York, devised a brace for these cases, using one perineal band—he calls it the perineal crutch.

When shall a case of hip disease be considered to have progressed far enough to permit the removal of the extension splint and the substitution of a convalescent brace? The solution of this problem is much a matter of judgment. It is better to allow the extension splint to be worn unnecessarily long than for the substitution to be made too soon. It is essential that one wait until all pain and acute symptoms have been absent for some months, and there exists no muscular spasm. Likewise during the convalescent stage it is better that the protective splint be worn longer than necessary than for too short a period. From one to three years will usually be necessary. The discontinuance of the protective splint should be a gradual process, the splint only being removed part of the day or for short walks; but when the patient intends to do considerable walking the splint should be resumed. After some days' or weeks' trial of leaving off the protective splint, should it be found that the joint is becoming painful and sensitive, it is better to return to the constant wearing of the splint for six months or a year longer.

OLD HIP CASES WITH DEFORMITY.

The deformities requiring correction are flexion and adduction. These deformities produce an apparent shortening of the limb, or, as it is called, "practical shortening," in contradistinction to real shortening, which latter may be quite small while the former is considerable. Abduction exists as a deformity, but, as it increases the practical length of a limb already actually shortened by disease, the deformity is rather of an advantage than otherwise and does not ordinarily require correcting, unless excessive. In adduction, besides shortening, there is tilting of the pelvis. In order to bring the foot down in the act of walking in those cases where there is fixation at a moderate angle of flexion, motion must take place at the spine, thus producing lordosis; and where the angle of deformi-

ty is great, it may be nearly or quite impossible to get the foot down. In these cases a practical lengthening of the leg is obtained by building up the shoe. When the deformity is of such a grade as to seriously interfere with progression, surgery is called upon for relief from the condition.

I have been surprised in several instances of old cases of hip disease with considerable deformity where it appeared that the ankylosis was very firm and bony, that on the application of continuous extension in bed for a few weeks the deformity would be considerably reduced. This had led me to believe that many if not most of these cases should be given a trial of extension in bed for reduction of deformity before proceeding to operative measures, or at least before performing osteotomy. By the use of adhesive straps to the leg, with weight and pulley, extension can be obtained, and counter-extension secured by the foot of the bed being raised or by the use of the perineals with attachment to head of bed. With considerable adduction it is a good plan to make counter-extension by a perineal to the other hip. After a trial of extension in bed with a failure to reduce deformity, there remains as means of correction: 1. Brisement force, with or without myotomy, tenotomy, fasciotomy, etc. 2. Osteoclasis. 3. Osteotomy.

Brisement force should be limited in use to those cases in which there is evidently only fibrous ankylosis. There is the danger in the use of too much force of fracturing the thigh bone at an unfavorable point; and again there is the danger of relighting the tubercular process. If there is considerable shortening of the flexor or adductor muscles, or of the fascia, subcutaneous division of these structures will greatly aid in rectifying the position of the limb. Frequently the capsule of the joint is found shortened, and, in some cases, an open incision down to the joint (cutting everything which obstructs, including the capsule) is found to be necessary before the limb can be straightened. After the limb is straightened it should be encased in a plaster-of-Paris spica, or fixed by means of extension. Absolute rest is necessary for a variable period; and should there be heat about the joint, giving evidence of some inflammation being produced, bags of ice placed about the hip frequently reduces this

activity in a short space of time. After all danger of inflammatory action is past the patient should be fitted with a protection splint and allowed to get about.

Osteoclasia and osteotomy are reserved for those cases in which there exists bony union or a fibrous ankylosis of a very firm character. It is true that osteoclasia is sometimes the result of brisement force, but this is accidental and not the desire of the operator. In performing osteoclasia appliances are used to hold the pelvis rigid while force is exerted on the limb sufficient to fracture the bone or break up the ankylosis; but the point of fracture is so uncertain and the operation as a whole lacks precision and is so unscientific that it has been replaced by osteotomy. Osteotomy is by far the most satisfactory operation for the rectification of deformity in a bony ankylosed hip. This operation has been performed at different points near the head of the bone. Adams' operation was a division of the bone at the neck. Sayre and Barwell divided the bone between the greater and lesser trochanters, while Gant performed osteotomy just below the trochanter minor.

This latter operation, now admitted the best by most surgeons, is based on the anatomical reasoning that the resistance of the psoas and iliacus being set free, a return of the deformity is not to be expected; also that by operating at a lower point than had formerly been done, the operator is more likely to strike healthy bone and less likely to relight the old inflammation.

GANT'S OPERATION.

Having determined that all inflammatory action in the joint has ceased and that probably nothing short of an osteotomy will correct the deformity, the night before the operation the thigh is encased in a dressing of soft soap, or soap liniment, with proper outside bandages. By the next morning it will be found that the outer layers of epidermis are softened and will readily wash off. Then ether and alcohol may be used to remove any oily or soapy substances remaining. The patient, under an anæsthetic, is placed on his side with a sand bag between the thighs. The trochanter minor having been marked out, the osteotome is introduced at a point just below the level of this trochanter, on the outer aspect of the thigh. The

best osteotome for this work is an instrument whose length should be about seven inches, width of cutting-edge three-eighths to one-half inch. It should be tempered to a hardness between that of a cold-chisel and the carpenter's chisel. The handle should be marked every half inch, to show the depth to which the instrument has penetrated. This is more than theoretically indicated, for I have seen the osteotome driven through the thigh and one and one-half inches into the sand bag. In introducing the instrument into the thigh, the edge of the blade is held parallel to the axis and is made to penetrate the skin, fascia, muscles, periosteum, down to the bone; the blade is then turned at right angles to the limb, and, with sharp blows of a mallet, preferably a wooden one, the osteotome is driven through the bone, being loosed and driven at different angles after every two or three blows. When only a shell of bone remains, the instrument is withdrawn and the fracture completed by manual force. The limb is then brought down to as nearly the horizontal plane as possible, at the same time putting it in a position of abduction. This abduction is to increase the practical length of the limb and is thereby a positive advantage. There is little or no bleeding. The wound in the skin is very small and is covered over by oiled silk or rubber gauze; over this is the antiseptic dressing, and over all is applied a plaster-of-Paris spica reaching from the axilla to the ankle, and it may also include the foot with advantage. The limb is left in the plaster spica from four to six weeks, after which it is removed, the parts examined and measure is taken for a convalescent walking splint. By the time it is made and applied the limb is strong enough to be used with the aid of the splint. The convalescent splint is worn for three to eight months, or longer.

As a result of these operations we have a practical lengthening of the limb from one to four inches, the limb placed in nearly a line with the body, and in walking the spine is held upright instead of being lordosed, as is required with a flexed limb.

Some time ago I reported in detail the results in sixteen cases following Gant's operation. I give a summary of that report in the table here appended.

From this table we see that the average age of the patient was

eleven years, the oldest being sixteen, the youngest five and one-half. We find that the hips were held fixed at an average of 135 deg., *i. e.*, half way between a straight leg and one held at a right angle. By the operation they were brought down on an average of 36 deg., thus bringing the leg to within 3 deg. of being perfectly straight (171 deg.). The average shows a shortening of two and a half inches before the operation and only one inch shortening after the operation. There was no motion at the hip in any case before operation, while after operation there was motion at the joint in several cases. All of the cases were improved in their ability to walk—some greatly, others only moderately. There were no untoward symptoms in a single case. We therefore conclude that the operation is a great boon to those having considerable deformity as the result of hip disease.

Case.	Age.	Time Spica Remained on.	Angle of Fixation Before Operation.	Amount Leg was Brought Down.	Greatest Extension After Operation.	Adduction before Operation.	Practical Shortening before Operation.	Increase in Practical Length.	Practical Shortening After Operation.	Am't of Motion at Hip Before Operation.	Amount of Motion at Hip After Operation.	Ability to Walk After Operation.
1	12 yrs.	8 weeks.	125 deg.	40 deg.	165 deg.	Considerable.	4 inches.	2½ inches.	1½ inches.	None.	Small angle.	Walking well.
2	13 "	4 "	135 "	"	"	"	8 "	6 "	2 "	None.	"	Limb strong.
3	14 "	"	155 "	"	"	Adducted.	2 "	2 "	None.	None.	Small amount.	Wearing brace.
4	6 "	4 "	150 "	20 "	170 "	"	1 "	½ "	½ inch.	None.	"	"
5	8 "	5 "	145 "	25 "	170 "	"	1¼ "	¼ "	1¼ "	None.	Slight Motion.	"
6	9 "	4 "	130 "	40 "	179 "	"	1 "	½ "	½ "	None.	"	"
7	7 "	4 "	120 "	"	"	24 degrees.	3½ "	1½ "	1¾ "	None.	"	Walks well.
8	10 "	4 "	130 "	45 "	165 "	"	3¼ "	1¼ "	2 "	None.	Considerable.	"
9	5½ "	4½ "	130 "	40 "	170 "	"	½ "	None.	½ "	None.	"	"
10	16 "	5 "	"	"	"	"	4½ "	2½ inches.	2 "	None.	"	"
11	15 "	6 "	135 "	"	"	"	None.	None.	None.	None.	Considerable.	Walking with comfort.
12	9 "	4 "	135 "	40 "	175 "	"	4 inches.	1½ inches.	2½ inches.	None.	40 degrees.	Greatly improved.
13	14 "	4 "	130 "	45 "	175 "	"	2 "	1 "	1 "	None.	None.	Walks well.
14	6 "	4 "	135 "	41 "	176 "	"	None.	½ "	½ (larger)	None.	None.	Much improved.
15	15 "	"	"	"	172 "	"	"	"	3½ inches.	None.	None.	Walks well.
16	14 "	5 "	140 "	30 "	170 "	"	2½ "	1¾ "	¾ "	None.	None.	"
Average.	11 yrs.	4wk, 5d.	135 deg.	36 deg.	171 deg.	"	2½ ins.	1½ inches.	1 inch.	"	"	All were improved.
Maximum.	16 "	8 "	155 "	45 "	176 "	"	8 "	6 "	3 "	"	40 degrees.	Greatly improved.
Minimum.	5½ "	4 "	120 "	20 "	165 "	"	0 "	0 "	0 "	"	0 "	Some moderate improvement.

THE WRITINGS OF DR. WM. E. WIRT.

Prof. Wirt has made the following contributions to the Literature of the Science of Medicine :

- I. A THEORETICAL AND PRACTICAL DEMONSTRATION OF THE ACTION AND TENSION OF THE TENDO ACHILLES IN SUPPORTING THE BODY ON TIP-TOE. Read before the Orthopedic Section of the New York Academy of Medicine, March 21, 1890. Published in the New York Medical Record June 28, 1890.
- II. RADICAL CURE OF HERNIA. Discussion before the Ohio State Medical Society. Published in the Transactions of the Forty-Sixth Meeting of the Ohio State Medical Society.
- III. CONGENITAL DISLOCATION OF THE HIP. ILLUSTRATED BY THREE CASES. Published in the Cleveland Medical Gazette, May, 1891.
- IV. CASE OF DOUBLE CLUB-FOOT, DOUBLE CLUB-HAND AND MULTIPLE DEFORMITIES. Read at the meeting of the American Orthopedic Association, in Washington, D. C., Sept. 1891. Published in the Philadelphia Medical News, Nov. 7, 1891; also in the Transactions of the American Orthopedic Association, (1891).
- V. A NEW TRACTION SPLINT. Read at the meeting of the American Orthopedic Association, in Washington, Sept. 1891. Published in the Transactions of the same society for 1891.
- VI. POTT'S DISEASE. Discussion before the Cuyahoga County Medical Society. Published in the Cleveland Medical Gazette Nov. 1891.
- VII. HIP DISEASE—OPERATIVE TREATMENT IN OLD AND NEGLECTED CASES—SIXTEEN CASES REPORTED. Published in the Columbus Medical Journal, March, 1892.
- VIII. THE TREATMENT OF CERTAIN FORMS OF CLUB-FOOT. A paper read before the Ohio State Medical Society at the Annual Meeting, May 5, 1892. Published in the Cincinnati Lancet-Clinic, July 23, 1892; also in the Transactions of the Ohio State Medical Society for 1892.
- IX. RICKETS AND THE TREATMENT OF ITS RESULTING DEFORMITIES. Read in the Section on Diseases of Children at the Forty-Third Annual Meeting of the American Medical Association, held in Detroit, June 7, 1892. Published in the Journal of the American Medical Association.
- X. CONSERVATIVE TREATMENT OF JOINT DISEASES. Read before the North-Eastern Ohio District Medical Association, at the meeting held in Elyria, O., March, 1893. Published in Annals of Gynaecology and Paediatrics, August, 1893.
- XI. HERNIA IN CHILDREN. Read in the Section on Diseases of Children, at the Forty-Fourth Annual Meeting of the American Medical Association, held in Milwaukee, June 6-9, 1893. Published in the International Medical Magazine, Feb. 1894; re-published by the Milwaukee Medical Journal, March, 1894.
- XII. TREATMENT OF INITIAL CASES OF CLUB-FOOT. Read before the Ohio State Medical Society, at the Annual Meeting, June 28, 1893. Published in the Transactions of the same society for 1893.
- XIII. TREATMENT OF OLD CASES OF HIP DISEASE. Read before the Mississippi Valley Medical Association, at the Annual Meeting, held at Indianapolis, Oct. 4-6, 1893. Published in the Medical and Surgical Reporter, (Philadelphia), Jan. 6, 1894.