Modern Surgery - Chapter 21. Orthopedic Surgery

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XXI. ORTHOPEDIC SURGERY.

This branch of surgery formerly dealt only with the treatment of deformities by means of mechanical appliances, but of recent years its domain has been enlarged to include the treatment, surgical and mechanical, of deformities, contractures, and many joint-diseases.

Torticollis (wry-neck) is a condition in which contraction of certain of the neck-muscles causes an alteration in the position of the head. The disease is one-sided; the sternocleidomastoid is the muscle chiefly involved, though the trapezius, the splenius, and other muscles sometimes suffer. Acute torticollis, which is rare, is a temporary condition, and results from cold or from injury (see Myalgia). Chronic torticollis may be congenital, may be due to nerve-irritation, to an assumed attitude because of eye-defect, to inflammation of the glands or to disease of the vertebrae, and it may be intermittent, but is usually persistent. The muscle stands out in bold outline, the head is turned to the opposite side, the ear of the disordered side is turned toward the shoulder, the chin is thrown forward, and spinal curvature may arise. The corresponding side of the face atrophies. There is no pain. In many cases the head may be restored to its normal position by passive movement or by voluntary effort, but it at once returns to its habitual position. Mikulicz asserts that torticollis is a chronic fibrous myositis, due often to compression during labor. He further says that the lesion known as hematoma of the sternomastoid, which occasionally follows labor, is not hematoma, but thickening due to myositis. In spasmodic wry-neck the muscle is thrown repeatedly into clonic contractions. In congenital torticollis the muscle and the cervical fascia are shortened, and the muscle does not relax under the influence of an anesthetic. In torticollis due to rheumatism and reflex causes the tonically contracted muscle relaxes when the patient is anesthetized.

Symptoms.—Congenital wry-neck is due to central nervous disease, to spinal deformity, or to injury during birth, and in this form the sternomastoid is shortened, hardened, and atrophied. It may not be noticed for some years because of the short neck of infancy. It is associated with asymmetrical development of the face, and is almost invariably upon the right side. Spasmodic wry-neck may present tonic spasm only, intermittent spasm alone, or both may appear alternately. It sometimes arises in those whose occupation demands frequent rotation of the head, but more often no such cause can be discovered. It is probably a disease of the cortical area which presides over rotation of the head. (See article by C. A. Hamann, in "Buffalo Med. Jour.," Dec., 1901.) It is a disease especially of adults; in women it is often linked with hysteria. The exciting cause may be a cold, a blow, or a mental storm; the predisposing cause is the neurotic temperament. It may be due to enlarged glands, to carious teeth, or to eye-strain. In some rare cases bilateral spasm occurs, the head being pulled backward and the face being turned upward. Clonic spasms may come on unannounced, or they may be preceded by pain and stiffness; the head can be held still for a moment only; there is sometimes pain, always fatigue, but during sleep the contractions cease. The attack will probably pass away, but will almost certainly recur.
Treatment.—Congenital wry-neck is treated by myotenotomy (through an open wound) and the use of proper braces and supports. The old subcutaneous myotenotomy should be abandoned, as aseptic incision enables the surgeon to see and to feel all the contracted bands of fascia, muscle, and tendon, and to avoid vital structures (page 474). In spasmodic wry-neck treat the neurotic temperament and remove any obvious irritation (eye-strain, carious teeth, enlarged glands). Drugs are practically useless. The rest cure is sometimes beneficial. Tenotomy is not to be employed. In persistent cases stretch or divide and exsect a part of the spinal accessory nerve (Keen). To reach this nerve, make an incision along the posterior edge of the sternocleidomastoid muscle, find the nerve as it emerges from under the middle of the muscle, about one and a half inches below the tip of the mastoid process, retract the muscle at this point, and remove at least one inch of nerve. Neurectomy of the spinal accessory nerve paralyzes the sternocleidomastoid muscle, in spite of the fact that that muscle has also a nerve-supply from the cervical nerves. The paralysis is followed by atrophy, and if the spasm affected the sternomastoid muscle only, the operation will cure the case. Unfortunately, other muscles are usually involved, and cure will only be obtained by performing neurectomy on the nerves which innervate the affected muscles. For the treatment of rheumatic wry-neck see Myalgia (page 553).

Dupuytren's contraction is a contraction of the palmar fascia, of its digital prolongations, and of the fibers joining the fascia and skin. Fixed contraction of one or more fingers occurs. The ring-finger and the little finger most often suffer, but any finger or the thumb may be involved. The condition may be symmetrical. The disease arises oftenest in men beyond middle age, but is sometimes met with in youths. The cause of this disease is unknown; some refer it to gout or rheumatism; others to traumatism, reflex irritation, or neuritis. If due to traumatism, the right hand should suffer most frequently; but it occurs in the left hand nearly as often as in the right (P. Jansen, in "Arch. f. klin. Chir.,” Bd. lvii, H. 4). Jansen examined specimens from seven cases and found connective-tissue hypertrophy and circulatory disturbance, the contraction being a result of the above-named processes.

Symptoms.—Dupuytren's contraction is indicated by a small hard lump or crease which appears over the palmar surface of the metacarpophalangeal joint. This nodule grows and the corresponding finger is gradually pulled down. In some cases the tip of the finger is forced against the palm. The skin becomes dimpled or puckered.

Treatment.—In treating Dupuytren's contraction subcutaneous multiple incisions may be made, the tense fascia and the fasciocutaneous fibers being cut. The finger is straightened and is placed upon a straight splint, which is worn continuously for a week or ten days and is worn at night for at least a month. A more satisfactory operation is that of Keen. Keen divides the skin by a V-shaped cut, the base of the V being downward, lifts up the flap, and dissects out the contracted tissue. A cure is most certain to be obtained by Lexer's radical operation. This surgeon excises the entire aponeurosis and considerable portions of the palmar skin adherent to the aponeurosis. In order to cover this wound it may be necessary to slide a pedunculated flap into the raw surface.
Syndactylism (webbed fingers) is always congenital, and may persist through several generations. Simple incision of the web is useless; the operation to be performed is that of Agnew or of Diday (Figs. 286, 287).

In Agnew’s operation a flap of skin from the dorsum is inserted between the fingers and sutured in place.

In Diday’s operation a flap is taken from the dorsal surface and another flap is raised from the palmar surface, and each flap is sutured to the finger from which it springs.

Polydactylism (supernumerary digits) is always congenital, is often hereditary, and is usually symmetrical. There may be an incomplete digit, or there may be an entire and well-developed finger or toe with a metacarpal or metatarsal bone. The connection to the metacarpus or metatarsus may be by a fibrous pedicle only. If the digit is complete, with a metacarpal bone, no operation is required; if it is incomplete or is ill-developed, it should be removed.

Trigger-finger or Jerk-finger.—The patient can usually close the fingers, but on trying to open them one finger remains closed. It can be opened by grasping it with the other hand, but flies open with a snap like an opening knife (Abbe). In some cases two fingers are involved. In a

Fig. 286.—Agnew’s operation for webbed fingers (Pye).
Fig. 287.—Diday’s operation for webbed fingers (Pye).

reported case (Frederick Griffith, “Annals of Surgery”) the ring and middle fingers of the left hand locked at the knuckle-joints on attempting flexion. The locking occurred when about one-third the amount of flexion necessary to grasp an object was achieved. By bending the fingers with the other hand unlocking was accomplished and flexion was finished voluntarily. In attempting extension blocking occurred at the same point and unlocking was accomplished in the same manner. In most cases, but not in all, there is pain when locking occurs. The condition is gradual in onset. Trigger-finger is often associated with rheumatism (in 52 cases out of 121, according to Necker). It is said by Tubby to be due to enlargement of the flexor tendon, or to contraction of the groove in the transverse ligament in the palm. It may be due to a ganglion, enchondroma, or tenosynovitis. Traumatism or irritation may produce it. The tendon-sheath may be thickened, or, according to Marcano, there may be a nodule on the tendon which rubs against the sesamoid bone (Griffith). It may result from occupation.

Treatment.—If a ganglion, a loose cartilage, or a sesamoid bone exists, treat by incision. If there is inflammation, use massage and counter-irritation. If there is no obvious cause, put a compress over the tunnel in the ligament and apply a splint.
Mallet-finger.—This is called also drop-finger and rupture of the extensor tendon. It is due to a blow in the direction of flexion when the finger is extended. It is supposed to be due partly to stretching and partly to rupture of the extensor tendon at the point at which it is the posterior ligament of the distal interphalangeal joint. Abbe has shown that baseball players are liable to a condition which is the reverse of this, in which the last phalanx is dislocated backward. Drop-finger is treated by incision and suture of the tendon to the periosteum (Abbe).

Genu valgum (knock-knee) results from an unnatural growth of the internal condyle, causing the shaft of the femur to curve inward and the internal lateral ligament of the knee-joint to stretch, the knees coming close together and the feet being widely separated. This deformity is usually noted when the child begins to walk, but it may not appear until puberty or even long after. Knock-knee may arise from rickets, from an occupation demanding prolonged standing, or from flat-foot. It may occur in one knee or in both knees.

Treatment.—Mild rachitic cases of knock-knee may remain in slight deformity, or may get well from improvement of the general health. In ordinary cases simply treat the rickety condition. The patient is forbidden to stand or to walk, and the limb, after being put as straight as can be, is fixed on an external splint and a pad is put over the inner condyle. Later in the case plaster-of-Paris is used. Some surgeons prefer to immobilize while the leg is flexed to a right angle with the thigh. In a severe case the surgeon can immobilize after forcibly straightening (causing an epiphyseal separation) or after the performance of osteotomy (Fig. 257). Osteotomy is preferable to fracture by a mechanical appliance (osteoclasis).

Genu varum (bow-legs) is the opposite of knock-knee. Usually both legs are bowed out, the knees being widely separated, the tibiae and femurs, as a rule, being curved, and the feet being turned in. This disease in early life is due to rickets, the weight of the body producing the deformity. In older people incurable bow-legs may arise from arthritis deformans.

Treatment.—Some mild cases of genu varum recover as a result of improvement in the health. Ordinary cases are treated by braces, by plaster-of-Paris bandages, and by attention to the general health. When the bones have hardened, osteotomy is necessary.

Club-hand.—A congenital deformity in which the hand deviates from the normal relation to the forearm. It is usually associated with other deformities. In some cases the radius and possibly some of the carpal bones are absent.

Treatment.—By massage and passive motion, by immobilization, by tenotomy or osteotomy.

Talipes (club-foot) is a permanent deviation of the foot. There are several forms. Talipes equinus (Fig. 288) is a confirmed extension; talipes calcaneus (Fig. 289) is a confirmed flexion; talipes varus is a confirmed adduction and inversion; and talipes valgus is a confirmed abduction and eversion. Two of these forms may be combined, as in talipes equino-varus (Fig. 290), talipes equino-valgus, talipes calcaneo-varus, and talipes calcaneo-valgus. The causes of talipes are congenital or acquired. The congenital form is due to persistence of the fetal form of the foot. Acquired
cases may arise from infantile paralysis, from spastic contractions, from cicatrices, from traumasms, from arrest of bony growth following upon the inflammation of bone, or from hysterical contractures.

*Talipes equinus* is rarely congenital. In this condition the patient walks upon the toes and cannot bring the heel to the ground.

*Talipes Calcaneus.*—The patient walks upon the heel and cannot bring the toes to the ground. The true form is seen in congenital cases, the flexors of the foot being shortened, and the tendon Achillis being lengthened.

*Talipes varus* is rarely met with without equinus. In this condition the patient walks on the outer edge of the foot.

*Talipes valgus* is met with in flat-foot. The patient walks on the inner edge of the foot.

*Talipes equino-varus.*—The heel is raised and the patient walks upon the outer edge of the foot. This is the usual congenital form.

*Talipes equino-valgus* is very rarely congenital. The heel is raised and the patient walks upon the inner side of the foot.

*Talipes calcaneo-varus* is a combination of calcaneus and varus.

*Talipes calcaneo-valgus* is a combination of calcaneus and valgus.

**Treatment.**—In congenital cases the condition is usually manifest on both sides, and is nearly always talipes equino-varus. Congenital club-foot should be treated in infancy, and when a restoration to position can be effected by the hands of the surgeon, is treated by plaster-of-Paris bandages. If a child has begun to walk, it may still be possible to correct the deformity eventually by manipulations, by plaster-of-Paris bandages, or by club-foot shoes, but most cases require tenotomy of the tendon Achillis before the application of the shoe or the plaster. The club-foot shoe may do good service, but in many instances it is painful and is not so efficient as plaster-of-Paris. In severe cases, before applying the plaster, the patient is given ether; the surgeon cuts the tendons of the anterior and posterior tibial muscles, the plantar fascia, and the tendon Achillis, in the order named, and forcibly corrects the deformity. In old cases with alteration in the shape of the bones, cuneiform osteotomy, or the removal of the cuboid or other tarsal bones, may be indicated. In these cases Phelps advises an open transverse division of all rigid plantar soft parts. Buchanan employs subcutaneous division of all resistant structures. Occasionally in relapsed and inveterate cases
astragalectomy is performed. It is seldom practised upon young children. (See page 547.) In some cases of talipes calcaneus shortening of the tendo Achillis is advised; but such an operation is only of temporary value, as stretching occurs after two years or more. In talipes due to infantile paralysis the operative treatment is the same, but we should not immobilize in plaster but rather in some apparatus which can easily be removed to permit the use of massage and electricity. In paralytic cases Nicoladoni’s operation is occasionally employed. This consists in dividing the tendon of the paralyzed muscle and attaching its distal end to the adjacent tendon of a healthy muscle. (For full consideration, see a work on Orthopedic Surgery.)

**Pes planus (flat-foot)** is a condition in which there is loss of the arch of the foot due to muscular paralysis or ligamentous weakness, to prolonged standing, or to trauma. Flat-foot is especially apt to occur in rickets. Spurious flat-foot, or inflammatory flat-foot, occurs in Pott’s fracture, and in inflammation of the ankle-joint or the tendon of the peroneus longus muscle. Paralytic flat-foot is seen after infantile paralysis. Static flat-foot is due to disproportion between the body weight and the support of that weight. All children are born with pronated feet; the arch usually begins to form soon after birth, but in some individuals it never forms. Flat-foot, according to de Vlacoces, is thus produced: If we suppose a straight line prolonged downward from the center of the leg, most of the astragalus and os calcis will be external to it; hence, the body weight presses on the inner side of the foot, and tends to flatten the arch and cause outward rotation, tendencies which are antagonized by the flexors of the toes and by the tibialis posticus muscle. The os calcis pronates and is pushed to the side, the astragalus moves after the os calcis, and the ligaments are stretched (“Rev. de Chir.,” Aug., 1901). Pes planus is productive of much pain upon standing or walking; in fact, the individual may be completely crippled. Pain is quickly relieved upon sitting down. Walking upon the toes is not painful. A distinctly flat foot can at once be recognized by wetting the sole of the patient’s foot with a colored fluid and causing him to step firmly upon a piece of paper (Fig. 291, A, B). Beginning flat-foot is frequently overlooked, the patient being treated for gout or rheumatism. Even a slight case can be detected by carefully observing the inner surface of the foot. When weight is placed upon it, it is seen to descend as the arch falls. A more accurate method is measurement, to find the middle of the foot. In flat-foot the extremity is lengthened. Golding-Bird points out that the middle of the foot is the point of articulation of the inner cuneiform and the metatarsal bone of the great toe. In flat-foot the greatest change is in the posterior half of this line. The extent to which the posterior measurement exceeds the anterior is the degree of flat-foot. The excess may reach three-fourths of an inch.

**Treatment.**—In paralytic flat-foot, which arises from infantile paralysis, employ exercise, electricity, and massage. In static flat-foot rest in bed is employed for two weeks, and then exercise is practised several hours a day to increase the arch. Rising upon the toes again and again is valuable.
After exercise the patient rests for a time, sitting tailor-fashion with the legs crossed under him. Massage is valuable. A shoe should be made containing a piece of steel so arranged as to raise the arch of the foot. The patient's general health must also be attended to. In very severe cases, with fixation and bone-formation, operation may be required. Gleich shortens the foot and raises the arch by sawing through the os calcis and fastening the posterior part of this bone at a lower level. Trendelenburg advises supramalleolar osteotomy. This operation permits of adduction, and the adducted foot should be put up in an immovable dressing of plaster-of-Paris. Ogston resects the astragaloscaphoid joint; Golding-Bird and Davy remove the scaphoid bone; Stokes removes a wedge-shaped piece from the head and neck of the astragalus.

**Pes cavus (hollow-foot)** is an increase in the arch of the foot, due, possibly, according to Golding-Bird, to paralysis of the peronei muscles. When the peronei muscles are paralyzed, the adductors act unopposed, and secondary contraction of the plantar fascia occurs. Certain it is that a contracted plantar fascia is the chief obstacle to correction. In many cases the cause is the wearing of shoes which are too short for the feet. The pressure made upon the toes causes spasm of the plantar flexors and this spasm permits the fascia to contract.

**Treatment.**—A shoe is worn containing a plate of steel in the sole, and pressure is applied over the instep. Tenotomy, division of the plantar fascia, or excision of bone may be required. In paralytic cases apply electricity and massage to the paralyzed muscles.

**Hallux valgus, or varus,** a displacement of the great toe outward or inward, may occur in the young, but it is most frequent in old men. It arises often from wearing narrow shoes, but may be due to gout or to rheumatic gout. In hallux valgus a bunion is apt to form over the metatarso-phalangeal joint.

**Treatment.**—An arrangement may be worn to straighten the toe and to protect the bunion (Fig. 281). The prominent and hypertrophied inner portion of the head of the metatarsal bone may be removed by means of a chisel, osteotomy may be performed upon the metatarsal bone, the joint may be excised, or amputation may be required.

**Hammer-toe** (Fig. 292) is a condition in which there is flexion of one or more toes at the first interphalangeal joint. Shattuck shows that this condition is due to contraction of "the plantar fibers of the lateral ligaments of the joint." This disease usually begins in youth and may be congenital. A bunion is apt to form, and the joint may become dislocated.

**Treatment.**—Terrier's plan of treatment consists in making a dorsal flap, removing a bursa if one is found, dividing the extensor tendon, opening the articulation, removing each articular surface with cutting forceps, suturing the soft parts, and applying a plantar splint for two weeks. Some surgeons excise the joint. Probably amputation of the toe is the best treatment.

* * American Text-book of Surgery."  
† Rev. de Chir., July, 1895.
**Metatarsalgia (Morton’s Disease).**—This disease was first described by Dr. Thomas G. Morton, of Philadelphia, in 1876. It is a painful condition of the foot, due to jamming of a nerve between the heads of the fourth and fifth metatarsal bones. The head of the fifth metatarsal bone is, by lateral pressure, forced against and below the neck of the fourth metatarsal, and as a result the superficial branch of the external plantar nerve and its two digital branches are squeezed. It is usually associated with flat-foot. Pain is produced by walking, and the suffering may be so severe that the patient is obliged to sit down at once. When the shoe is removed and the foot is rested, the pain soon abates. The pain is felt on the outer and inner sides of the little toe, the outer side of the fourth toe, and about the head of the fifth and the neck of the fourth metatarsal bones. Pain can be developed by grasping the foot in the hand and squeezing it. If flat-foot exists, there is also pain due to this trouble.

**Treatment.**—Mild cases may be cured occasionally by wearing well-fitting shoes and employing massage. Some cases require a brace. Severe cases demand resection of the fourth metatarsophalangeal joint, or amputation of the fourth toe, and with it the head of the fourth metatarsal bone. Graham, of Washington, has cured cases by excising a portion of the superficial branch of the external plantar nerve.

**Coxa vara** is a disease characterized by bending of the neck of the femur, the hip-joint being perfectly healthy, and the condition, as a rule, being unilateral. This condition was described by Müller in 1889. Coxa vara begins, as a rule, between the thirteenth and twentieth years, and the commonly accepted view has been that the deformity is rachitic, but Kredel has reported two congenital cases.* Traumatic coxa vara may follow fracture of the neck of the femur in a child. The patient develops a limp, and grows tired after slight exertion, but there is no swelling nor tenderness, and little or no pain. Shortening after a time becomes apparent, and the trochanter can be detected above Nélaton’s line. The extremity is adducted. The x-rays show the deformed bone.

**Treatment.**—As long as bending is progressing employ rest. When the bone hardens it may be necessary to perform osteotomy below the trochanters.

**Flail-joints.**—After an attack of infantile paralysis involving the entire lower extremity of each side, the limbs become limp and swing flail-like when the extremity is made to move, and the joints are much relaxed. In such cases the psoas and iliacus muscles are never completely paralyzed, and the aim of the surgeon is to utilize these muscles in enabling the patient to walk. In many cases the application of apparatus is sufficient. In others ankylosis may be established in the ankles and knees by operation. If ankylosis is established in these joints, the psoas and iliacus muscles become able to move the legs.

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