

**Staff Meeting Bulletin
Hospitals of the » » »
University of Minnesota**



**Surgery of
Forearm and Wrist**

INDEX

	<u>PAGE</u>
I. CALENDAR OF EVENTS	335 - 336
II. SURGERY OF FOREARM AND WRIST	
. Arnold G. Schwyzer	337 - 343
III. GOSSIP	344

Published for the General Staff Meeting each week
during the school year, October to June, inclusive.

Financed by the Citizens Aid Society,
Alumni and Friends.

William A. O'Brien, M.D.

UNIVERSITY OF MINNESOTA MEDICAL SCHOOL
 CALENDAR OF EVENTS
 April 24 - April 29

Visitors Welcome

Monday, April 24

- 9:00 - 10:00 Roentgenology-Medicine Conference; L. G. Rigler, C. J. Watson and Staff, Todd Amphitheater, U. H.
- 9:00 - 11:00 Obstetrics and Gynecology Conference; J. L. McKelvey and Staff, Interns Quarters, U. H.
- 12:30 - 1:30 Pediatrics Seminar; Pediatric Aspects of Heredity; Dr. Oliver, W-205 U. H.
- 12:30 - 1:30 Pathology Seminar; The Mechanism of Sucrose Damage of Kidney Tubules; Harry A. Wilmer, 104 I. A.
- 4:00 Preventive Medicine and Public Health Seminar; Influenza A; C. M. Ecklund, J. Crowley, Ruth E. Boynton, D. Cowan, 6th Floor, H.S.Lounge

Tuesday, April 25

- 8:00 - 9:00 Surgery Journal Club; O. H. Wangensteen and Staff, Main 515, U. H.
- 9:00 - 10:00 Roentgenology-Pediatrics Conference; L. G. Rigler, I. McQuarrie and Staff, Eustis Amphitheater, U. H.
- 11:00 - 12:00 Urology Conference; C. D. Creevy and Staff, Main 515, U. H.
- 12:30 - 1:30 Pathology Conference; Autopsies, Pathology Staff, 104 I. A.
- 12:30 - 1:30 Physiology-Pharmacology Seminar; Adrenal Cortical Times Zone; Robert Huseby, 214 M. H.
- 4:30 - 5:30 Obstetrics and Gynecology Conference; J. L. McKelvey and Staff, Station 54, U. H.
- 4:00 - 5:00 Pediatric Grand Rounds; I. McQuarrie and Staff, W-205 U. H.
- 5:00 - 6:00 Roentgen Diagnosis Conference; R. H. Beiswanger and G. M. Kelby; M-515 U. H.

Wednesday, April 26

- 9:00 - 11:00 Neuropsychiatry Seminar; J. C. McKinley and Staff, Station 60, Lounge, U. H.
- 10:30 - 12:30 Otolaryngology Case Studies; Out-Patient Ear, Nose and Throat Department; L. R. Boies and Staff.
- 11:00 - 12:00 Pathology-Medicine-Surgery Conference; Chronic Interstitial Pneumonia; Acute Endocarditis; Carcinoma of Prostate; E. T. Bell, C. J. Watson, O. H. Wangensteen and Staff, Todd Amphitheater, U. H.

- 12:30 - 1:20 Physiological Chemistry Journal Club; Current Literature Reviews, Staff, 116 M. H.
- 12:30 - 1:30 Pharmacology Seminar; Oxytocis; Elizabeth M. Cranston; 105 M. H.
- 4:00 - 5:00 Obstetrics and Gynecology Journal Club; J. L. McKelvey and Staff, Station 54, U. H.
- 4:30 - 5:30 Neurophysiology Seminar; Effect of Anoxia on Reflexes; Wm. Kubicek, 113 M. D.

Thursday, April 27

- 9:00 - 10:00 Medicine Case presentation; C. J. Watson and Staff, Todd Amphitheater, U. H.
- 10:00 - 12:00 Medicine Rounds; C. J. Watson and Staff, East 214 U. H.
- 12:30 - 1:30 Physiology Chemistry Seminar; The Use of Heavy Isotopes as Tracers; H. G. Wood, 116 M. H.
- 4:30 - 5:30 Bacteriology Seminar; Glyocladin and Clavicem; Daniel Tenenberg, 113 M. D.

Friday, April 28

- 9:00 - 10:00 Medicine Grand Rounds; C. J. Watson and Staff; Todd Amphitheater, U.H.
- 8:30 - 10:00 Pediatrics Grand Rounds; I. McQuarrie and Staff.
- 10:00 - 12:00 Medicine Ward Rounds; C. J. Watson and Staff; East 214 U. H.
- 11:45 - 1:15 University of Minnesota Hospital General Staff Meeting; Urinary Incontinence in the Female; G. E. Rogers, Powell Hall Recreation Room.
- 1:30 - 2:30 Medicine Case Presentation; C. J. Watson and Staff, Eustis Amphitheater.
- 1:00 - 2:30 Dermatology and Syphilology; Presentation of selected cases of the week; Henry E. Michelson and Staff; W-306 U. H.
- 1:30 - 3:00 Roentgenology-Neurosurgery Conference; H. O. Peterson, W. T. Peyton, and Staff, Todd Amphitheater, U. H.

Saturday, April 29

- 9:00 - 10:00 Medicine Case Presentation, C. J. Watson and Staff, Main 515 U. H.
- 9:15 - 11:30 Surgery-Roentgenology Conference; O. H. Wangensteen, L. G. Rigler, and Staff, Todd Amphitheater, U. H.
- 10:00 - 12:00 Medicine Ward Rounds; C. J. Watson and Staff, E-214 U. H.

II. SURGICAL DISEASES OF THE FOREARM AND WRIST

Arnold G. Schwyzer

During the past year we have had two cases of tuberculosis of the wrist, one of which was secondarily infected. In the x-ray both cases showed the typical rarefaction, which is due largely to the fact that a tuberculous infection causes a hyperemia, which tends to decalcify bone. The rarefaction and hazy appearance are characteristic of tuberculosis. The case which was not secondarily infected () was treated by arthrodesis with a bone graft. This type of a graft for the wrist, a bail graft, is used and described by Brittain in "Architectural Principles of Arthrodeses." The x-ray of the tibia shows its shape. One end is inserted into the radius and the other into the middle metacarpal. The greater breadth of the graft is placed at a right angle to the plane joining the radius and ulna, as it can resist flexion of the wrist most readily in this position and flexion tends to wedge it in more firmly. A subsequent x-ray shows that the graft is being incorporated into the host. In tuberculous osteitis of the wrist Orell has carried out resection and curettage, and then he replaced the diseased bone by os purum which is specially prepared animal bone. Robertson-Lavalle drills down to the tuberculous focus and inserts autoplasmic bone grafts without preliminary evacuation. The healing from insertion of a graft is due to the immobilization, to the rapid vascularization of grafts, and to the fact that it is an abundant source of new calcium.

The other case () was secondarily infected, and at first we were not certain that amputation could be avoided. The case was treated by evacuation of as much necrotic bone as possible, the application of gauze saturated with cod liver oil ointment and sulfathiazole, and continued rest in a closed plaster cast. An x-ray taken two weeks after surgery revealed slight increase in density of the bone. One year postoperatively the condition has greatly improved. Two areas are still granulating and discharge occasionally, but the patient may soon have a hand with fair function.

Many infections, which seem incurable, respond to the closed plaster method. Other methods of treating secondarily infected tuberculous lesions of bones and joints have been reported. Mahler has used the Mosetig-Moorhof bone plug to fill tuberculous cavities, which had been previously cleaned out. This pack consists of 60 parts iodoform, 40 of spermaceti, and 40 of sesame oil. This heals in and is resorbed and replaced by connective tissue in six to twelve months. Payr used wax and paraffin fillings, but both of these fail to provide a strong support. Filling the cavity with plaster of Paris, sometimes mixed with Rivanol (1:1000), gave better results.

Orell has had excellent results with the use of os purum and os novum, the latter being prepared by implanting os purum under the periosteum of the tibia. In clean cases in which no tuberculous focus has been left behind these grafts heal in per primum. In septic cases the graft is usually destroyed, and in these cases one should consider the use of the Mostig-Moorhof bone plug. Before insertion of a graft the tuberculous cavity is curetted out, and then thermo-coagulation up to 100 degrees is used.

In diagnosing tumors of the bones of the wrist the possibility of a metastatic tumor must be kept in mind. One case () had a bony lesion with definite soft tissue swelling, which was biopsied. This was first diagnosed as synovioma, although the patient had had a nephrectomy for a tumor of the pelvis of the kidney. Later it was diagnosed as a metastatic lesion. We heard that an extensive local resection had been carried out at another clinic, but we do not know anything about the subsequent course. Geschickter and Copeland and formerly Bloodgood recommend resection of a bone for a tumor, where this does not mean a crippling amputation, as in the bones of the forearm, the fibula, and the upper end of the humerus. We have had a case of sclerosing osteogenic sarcoma of the ulna, which was treated by resection of the ulna (). At operation it was found that the tumor had questionably infiltrated the soft tissues and this makes the prognosis very

grave. We have not been able to contact this patient since his discharge. If after resection of a bone of the forearm, for a tumor, no recurrence takes place, the defect may be repaired by a transplant, although there is surprisingly good function in cases of resection of the radius or ulna.

The distal end of the radius is a fairly common site of giant cell tumors and benign bone cysts, which are thought to be arrested giant cell tumors. The best treatment of a giant cell tumor or a cyst is excision of a window in the cortex, curettage of the cavity, cauterization with phenol followed by alcohol, and replacement by bone grafts and chips. Some x-ray therapy is beneficial, but it should not be relied on solely. The radius and ulna are non-weight bearing bones, and for this reason they often advance rather extensively before causing severe symptoms. The tumor expands the cortex, and eventually it may infiltrate the soft tissues. Once it has broken through the shell of the bone, the chances of a permanent cure by conservative methods are much poorer. If a giant cell tumor of the radius recurs after being curetted once, Geschickter and Copeland recommend resection of the distal end of the radius and replacement by a transplant. If this is done, the wrist usually has to be fused. Case () - Gillette Hospital, was diagnosed by x-ray as a bone cyst. Curettage, cautery, and replacement by graft were carried out. However the pathological report on the tissue was a Brodie abscess.

A very disabling but quite rare deformity of the wrist is Madelung's deformity. This is caused by excessive growth of the dorsal side of the epiphysis, forcing the wrist into a flexed position. In some cases an osteotomy of the radius improves position and function of the wrist.

This patient sustained an injury to his wrist about nine months before coming to the University Hospitals. At this time there was extreme atrophy of the thenar eminence and also anesthesia over the distal two phalanges of the second and third fingers and the radial half of the distal two digits of the fourth finger.

This indicates a median nerve lesion. The x-ray of the wrist might at a glance appear to be normal, but closer examination reveals this to be a dislocation of the semilunar bone. An incision was made on the volar surface of the wrist, and as soon as the skin, fascia, and transverse carpal ligament were incised, the median nerve was found. If such a case is seen early, one may replace the semilunar, but in late cases excision is the procedure of choice. In this case the lunate bone was removed. The anatomy of this region has been described by Grodinsky and Holyoke (Anatomical Records, April 1941). The median nerve is located just beneath the transverse carpal ligament, to the ulnar side of the flexor longus pollicis tendon. At operation it was noted that the nerve was frayed, but already the next day the patient had more feeling in his hand. Function of the muscles of the thenar eminence has largely returned.

Every patient with an injury to his wrist must be carefully examined for a fracture of the scaphoid. Tenderness on the radial side, especially near the anatomical tobacco pouch, must be assumed to be a fracture of the scaphoid, until repeated x-ray examinations show otherwise. Oblique three-quarter views often reveal a fracture, when antero-posterior and lateral views are negative. Such a fracture must be immobilized in a somewhat "cocked-up" position until union has been reached. The plaster which should include the thumb, should not reach beyond the flexion crease of the palm of the hand so that motion of the fingers is not lost. The blood supply enters the bone through the tubercle, where the transverse carpal ligament and the abductor pollicis brevis attach. The farther away from this the fracture occurs, the greater are the chances of non-union and avascular necrosis, as in the neck of the femur the farther away from the intertrochanteric line the fracture occurs, the greater the chances of non-union. Sclerosis and cavitation indicate non-union. Drilling may be done to hasten union, and in many cases a bone peg graft should be inserted. The best approach to the navicular is through the anatomical snuff-box.

In some cases excision of the proximal fragment of the scaphoid should be done. If there is no decalcification of the proximal fragment, i.e., the fragment farther away from the source of blood supply, excision may be done, as this indicates complete loss of vascularity. Also excision should be done within a few weeks of injury, to prevent the development of traumatic arthritis. Magnuson (S.G.O., July 1941) believes that degenerative arthritis is the result of constant irritation and slight, but continuous, trauma. A painful wrist will, however, result in some cases in which union has definitely occurred. Arthrodesis is then the best procedure, as a painless ankylosed joint is far superior to a joint with some motion, which is painful.

We have had a case () who complained of pain near the ulnar side of the carpus. This was thought to be avascular necrosis of bone or tuberculosis and an arthrodesis, according to the technic of Nrittain, was done. She, however, did not get complete relief of pain, and at a later date excision of the triquetral bone was performed, resulting in complete alleviation of symptoms. The report on the biopsy specimen was mild chronic inflammation with necrosis of bone and fibrous marrow. When complete excision was done, the report was osteoid tissue with fibrous marrow, as seen in Paget's disease.

Case (). This case was admitted to the University Hospitals with an old fracture of the distal end of the radius and ulna in poor position. He complained of pain and disability of the wrist. According to the technic of Smith-Peterson a radio-carpal fusion was done, using the distal end of the ulna as a graft. The wrist is now painless, and pronation and supination are not sacrificed by the radio-carpal fusion. A "bayonet" incision was made, starting along the ulna and passing into the hand in the radial side of the pisiform bone. The dorsal branches of the ulnar nerve were left by this incision. The distal end of the ulna, three or four centimeters from the end, was resected, affording excellent exposure of the wrist. The cartilaginous surfaces of the radius, navicular, and semilunar

bones were curetted out, and the section of ulna was inserted as a graft in a trough gouged out of the radius and semilunar bones. Function is excellent, as the wrist is painless and pronation and supination are not lost.

Various procedures have been used for correcting a mal-united Colles fracture. Campbell performs an osteotomy of the radius and maintains it in its normal slightly flexed position by inserting a bone graft into the osteotomy on its dorsal aspect. The graft is obtained by splitting the distal end of the ulna longitudinally. Ghornley and Mroz advise excision of the lower end of the ulna where it projects beyond the radio-carpal articulation. Case (UH) - This patient had a very marked silver fork deformity of both wrists. Resection of the distal end of the ulna resulted in great improvement on one side.

As the result of unequal length of one bone, there may be radial or ulnar deviation of the hand. The hyporemia of osteomyelitis may cause excessive growth of one bone. We have had a case of a severe compound fracture of the bone of the forearm, which responded very well to the closed plaster method. The x-ray suggested a previous osteomyelitis, which had healed and was thought to have been reactivated by the injury. However no history of a previous osteomyelitis was obtained. A cast, besides immobilizing the fracture, is needed almost as much to prevent edema of the tissues. The distal end of the radius sequestered off, leaving the periosteum with a slight involucrum and the epiphysis. Approximately a year after being seen the first time, about two centimeters of the shaft of the ulna was resected to bring the hand into a normal position.

Case - University Hospitals -
At the University Hospitals we had a case of a fracture of the proximal end of the radius in a ten year old girl. On admission the x-ray revealed that the proximal end of the radius was displaced anteriorly and laterally. As the injury was two days old on admission and had caused marked swelling, the extremity

was treated by the application of hot packs and elevation. Also an upper respiratory infection necessitated postponing an anesthetic for about a week. Ten days after the injury the head of the radius was exposed through the lateral incision, the J-shaped incision of Kocher. The head of the radius was replaced into its normal position just anteriorly to the capitulum. However, it was found difficult to hold it in position, but this was easily accomplished by inserting a wire through the radius about two inches distal to the fracture, where it curves slightly, and into the proximal fragment, the end of the wire projecting through the plaster. A long arm plaster was applied with the elbow flexed to ninety degrees with the palm pointing toward the chest. Three weeks later the wire was removed, and active motion was started soon after. The arm was also placed in a whirlpool, and after about four months the child regained full extension and almost complete flexion. In a child excellent function, without loss of range of motion, can often be obtained, provided passive stretching is strictly avoided. For such a fracture in an adult, excision of the proximal fragment and early active motion may be the best procedure.

At Gillette Hospital we have had a number of cases of Volkmann's contracture of the forearm. The best treatment of Volkmann's contracture is prevention. Griffiths (British Journal of Surgery, Oct. 1940 and the Year Book of Orthopedic Surgery, 1942) believes that the contracture is due to ischemia of the muscles, which can be brought about by occlusion of the artery by compression between the fragments of the fracture or by spasm of the artery and all the collateral branches by injury to the artery. Experimentally segmental spasm of the artery has been demonstrated by Leveuf. The most reliable sign is the radial pulse, and when this disappears, the fracture should be explored to release the artery from pressure of the fragments. If the radial pulse does not return, the artery should be carefully inspected, and at the point of trauma a section two or three centimeters long should be resected. This interrupts the sympathetic innervation which causes the spasm, but resection of

the occluded artery does it far more effectively than injection of the cervical sympathetics. Other causes have been stated for this contracture, as too tight splinting. Hill and Brooks et al in 1936 had several cases in their report which had had no splinting at all. They, however, did adhere to other theories, as venous congestion.

Case - Gillette Hospital -
This patient had had a severe fracture of the bones about the elbow joint, with a Volkmann's contracture. Two operations were done to improve motion of the elbow joint. Wilson has treated cases of limitation of extension of the elbow, caused by Volkmann's contracture by anterior capsulectomy. The forearm was in a position of almost complete pronation, with no possibility of supination. The position of the hand was slightly flexed and deviated to the radial side. The carpal bones projected slightly posteriorly. After removal of the distal end of the ulna, a radio-carpal fusion was done, using the ulna as a graft. In this case also pronation and supination were preserved.

Case - Shrine and Gillette Hospitals -
This is a case of a severe birth injury, rendering the left arm almost useless in function. Arthrodesis of the wrist in a slightly cocked up position was carried out by insertion of a graft across the distal end of the radius, carpal bones, and the third metacarpal. The elbow was also arthrodesed at 100 degrees flexion by removal of the articular cartilage and inserting a graft through a drill hole extending through the olecranon and into the lateral humeral condyle.

Case - Gillette Hospital -
This is a case of poliomyelitis, causing paralyzed atrophy of the entire arm, especially below the elbow. The wrist was in a position of almost complete supination, and no pronation was possible. There was paralysis of most of the flexors of the hand and wrist, while the extensors of the fingers were fair. Consequently a contracture of the joint capsule, with the fingers in extension, developed. Incisions were

made on the dorsum of the hand, and these were carried down through the capsule of the metacarpophal-angeal joint. At the junction of the middle and upper thirds of the ulna, an osteotomy was done. A cast was applied, flexing the fingers and pronating the wrist. Milch has recommended a rotation osteotomy of the ulna for pronation contracture.

In another case some disability was caused by spastic pronation of the forearm. One case, , sustained a simple fracture of the shaft of the radius at about the junction of the middle and distal thirds. This fracture was difficult to hold in close approximation, and before being sent here, it was plated. Although the plate held the ends of the bone together, there was definite motion at the fracture site. The best surgical approach to this part of the radius is made by retracting the extensor digitorum communis to the ulnar side and the radial extensors of wrist to the radial side. More distally, where the abductor and extensors of the thumb cross the extensors of the wrist, these former are retracted to the ulnar side. In this case the incision was made down through the extensive scar tissue. The plate was removed, and after drilling of the bone for ingrowth of new granulation tissue, an onlay bone graft was applied. Union of the radius followed this procedure.

Another case of a compound fracture of the radius and ulna had been debrided and held by internal fixation, before being seen by us. Subsequently, it had developed a non-union. At operation a large cavity with synovial fluid was found at the areas of non-union. As is usually the case, the tissues about the pseudarthrosis were extremely anemic. In order to facilitate the application of bone grafts, the synostosis between the bones was separated which later was found to have recurred. So that the wrist is able to resist stresses in more than one direction, the onlay grafts were applied in two separate planes.

At the Willis Campbell Clinic non-unions of the bones of the forearm have been treated by dual grafts by Speed and

Boyd. They have found these grafts very useful in non-unions in the neighborhood of joints, as the distal end of the radius. Near a joint much of the bone is cancellous, and the cortex is thin and osteoporotic. With the forceps-like action of the dual grafts, excellent fixation of the short fragment can be obtained. Also bridging of defects can be accomplished very well with dual grafts without resorting to shortening the other bone in the forearm - a procedure which is very hazardous if the non-union in the other bone was due to a compound fracture.

Poliomyelitis may affect the wrist and hand in a variety of ways. Owing to weakness of the extensor muscles, a wrist-drop may develop. This disability may be greatly improved by transplanting the insertions of the flexor carpi ulnaris and radialis to the dorsum, which can also be performed in cases of wrist-drop from injury to the radial nerve.

Loss of opponens power to the thumb is a very disabling paralysis. Bunnell is one of the foremost authorities on the surgery of the intrinsic muscles of the hand. For this paralysis he takes the flexor carpi ulnaris and lengthens it with a graft of the palmaris longus tendon. A tendon graft is used to make a pulley attached to the pisiform, and the other end of the lengthened flexor carpi ulnaris tendon is attached to the distal end of the first metacarpal of the thumb. This may also be done by taking the short extensor of the thumb and passing it subcutaneously around the os pisiformis and attaching it to the flexor carpi ulnaris.

Thompson takes the tendon of the flexor sublimis to the fourth finger distal to the carpal ligament and passes it subcutaneously to the thumb. Distally the tendon is split, one half being drawn through a hole drilled through the distal end of the metacarpal and the other half being attached to a tunnel in the periosteum and fascia, after being brought over the extensors of the thumb. If insufficient opposition results, a rotation osteotomy may be done at the base of the first metacarpal.

If there still is power in the flexors of the thumb, function will be far better than if this is lacking.

For the loss of adduction Bunnell transfers the tendon of the extensor communis to the index finger around the ulnar side of the hand to the thumb.

If tendon transplantations have been unsuccessful, fusion of the metacarpals of the thumb and index finger for opposition of the thumb may be done with a bone graft. Often in poliomyelitis the intrinsic muscles of the hand may be severely affected. In such a case with very extensive damage to the intrinsic muscles, a tendon transplant does not produce satisfactory results. A case of poliomyelitis, J.S., with extensive involvement of opponens, interosseous, and lumbrical muscles was admitted to Gillette Hospital. Prior to admission a tendon transplant had been carried out, but this was unsatisfactory. Owing to the extensive weakness of the intrinsic muscles, a bony operation, rather than another soft tissue procedure, was carried out. Arthrodesis of the thumb in opposition to the other fingers was carried out with a bone graft, $2\frac{1}{2}$ cu. by 3 cu. taken from the wing of the ilium. Drill holes were placed through the first and second metacarpals and enlarged in the longitudinal direction, and the ends of the wedge-shaped graft were inserted into these holes.

A case of poliomyelitis, , at Shrine Hospital, with severe involvement of the right arm also was treated by arthrodesis of the thumb to the index finger in the same manner. In this case the chief elbow flexors, the biceps and brachiales, were paralyzed. However, the pronator-flexor group of forearm muscles, which arise from the medial epicondyle were strong. In this case the Steindler flexoplasty, which consists of advancement proximally of the medial epicondyle, was carried out. The medial epicondyle with its muscular attachments is removed with an osteotome, care being exercised not to injure the ulnar nerve, and advanced up, usually about two inches, higher on the shaft of the humerus.

At Shrine Hospital we have had two cases - sisters - and - who have numerous osteoma-like growths throughout the skeleton. One of these - B.M. - had a deformed radius and ulna. This is a case of an achondroplastic type of dystrophy. Chondrodystrophy refers to a condition characterized by a deranged rate of growth of bone from cartilage. In the achondroplastic type of dystrophy the bones are short and broad. Owing to uneven growth the epiphyseal lines are irregular. The lack of depth of epiphyseal cartilages is the only feature distinguishing these cases from other types of chondrodystrophies. In this case both forearms were shortened, and the distal end of the radius was irregularly widened bilaterally. The deformed ulna was removed on one side. A correcting osteotomy of the radius was carried out, and the fragments were held in position with a vitallium plate.

Deformity of the bones of the forearm is also characteristically caused by chondrodysplasia, a condition in which the production of bone from cartilage is deranged, some areas of cartilage not being ossified at all. This results in defects in various parts of the skeleton, and it may take the form of fibrous tissue, cartilage, cysts, or non-reticulated calacareous tissue. Large central non-osseous defects may result in solitary osteitis fibrosa. Enchondromata of the small bones of the fingers is usually seen in this disease. Characteristically there is partial arrest of development of the skeleton and curvatures of the long bones as in rickets. Frequently the ulna and fibula are short in relation to the radius and tibia. In some cases there is squaring off of the ends of the long bones, and in the forearm there is fusion of the radius and ulna. In another type of chondrodysplasia the outstanding feature is multiple ecchondroses. Pressure on important nerves and blood vessels is usually the only indication for treatment.

References

1. Brittain, H. A.
Architectural Principles of
Arthrodeses.
2. Girdlestone, G. R.
Tuberculosis of Bone and Joint.
3. Phemister, D. B.
Rapports, Proces-Verbaux et Dis-
cussions de La Societe Inter-
nationale de Chirurgie.
Onzieme Congress, Bruxelles, '38.
4. Orell, Svante
Rapports, Proces-Verbaux et Dis-
cussions de La Societe Inter-
nationale de Chirurgie.
Onzieme Congress, Bruxelles, '38.
5. Watson-Jones, R.
Fractures and Other Bone and Joint
Injuries.
6. Geschickter, C. F. and Copeland,
M. M.
Tumors of Bone.
7. Murray, Gordon
Bone Graft for Non-union of Scaphoid.
British Journal of Surgery, XXI,
63, '34.
8. Magnuson, P. B.
Joint Debridement. Treatment of
Degenerative Arthritis.
Surg., Gyn., & Obst., July, '41.
9. Griffiths,
British Jr. of Surg., 28:239, '40.
10. Griffiths,
The Year Book of Industrial and
Orthopedic Surgery, '42.
11. Milch, Henry
Rotation Osteotomy of the Ulna for
Pronation Contracture of the
Forearm.
Jr. of Bone and Joint Surg., Jan.
'43.
12. Thompson, T. C.
A Modified Operation for Opponeus
Paralysis.
Journal of Bone and Joint Surg.,
July, '42.
13. Thompson, C. F.
Fusion of Metacarpals of Thumb and
Index Finger to Maintain Function-
al Position of the Thumb.
Jr. of Bone & Joint Surg., Oct. '42.
14. Bunnell, Sterling
Treatment of Tendons in Compound
Injuries of the Hand.
Jr. of Bone and Joint Surg., April,
'41.
15. Boyd, Harold B.
Treatment of Difficult and Unusual
Non-Union.
Jr. of Bone and Joint Surg., Vol.
XXV, No. 3, July, '43.
16. Leveuf, J.
Jour. de Chir, ii, 177, '38.
17. Wilson, P. D.
Capsulectomy for flexion con-
tractures.
J.B. & J.S. Vol. XXVI, No. 1, Jan.,
'44.
18. Cole, W. H.
Chondrodysplasia.
Surg., Gyn. & Obst. March '26.
19. Ferguson, A. B.
Roentgen Diagnosis of Spine and
Extremities.
20. Brailsford, J. F.
Radiology of Bones and Joints.
21. Pohl, J. F.
Chondrodystrophy.
J.B. & J. S., Jan. '39.

III. GOSSIP

E. L. Tuohy of Duluth was elected president of the Minnesota State Medical Association at the annual meeting in Rochester, April 13, 14, 15, 1944. For many years Dr. Tuohy has been a leader in medical affairs in northern Minnesota and in the American College of Physicians. He has also helped in civic affairs in Duluth but he made his greatest contribution in the field of medical education, and through his efforts and leadership, he has been a credit to medicine in Minnesota. Through the years he has maintained an active interest in the development of the medical school, and few men who are not active members of our group know as much about our faculty as he does. His election to the Presidency of the State Association is the direct result of his leadership in medical education....Speaking of Presidents, William T. Peyton has just finished a successful year as Head of the Minnesota Pathological Society. He will be succeeded by Wesley W. Spink who has just returned from a three-months' assignment at Camp Carson, Colorado, where he has been conducting special investigations. German war prisoners he encountered were confused by the unwillingness of the world to accept German leadership and direction. They felt the Germans had demonstrated that they are the superior race and the rest of us haven't done so well. It will take a long time to convince the present generation that they are mistaken....An army officer who has returned from extended duty in the Southwest Pacific recently pointed out that in addition to caring for the military forces our medical corps must take care of the natives. As military physicians we do not march, carry flags, or use guns, and so are considered rather inferior specimens from the great land of opportunity....It is impossible to escape the conclusion that tropical diseases will be an important factor in determining the type of medicine we will practice in the future. This is true even though there will not be any great spread to the civilian population.. ..The Center for Continuation Study announces the first continuation course in medicine in the new series which was started at the re-opening of the Center this spring. There will be a course in

surgery May 8-9-10, 1944 which will feature Dr. Harold Brunn, of San Francisco, supported by our staff. This gentleman is one of those rare souls who has been a student all his life, and as he grows older, his energy increases. In his earlier years he did not publish a great deal, but his list of publications in later years is impressive. His name is associated with the development of thoracic surgery from its very beginning. We trust a good group of physicians will come to hear him, and that the faculty will be present for the special functions to be arranged for them with Dr. Brunn....Forty fellows of the American College of Hospital Administrators are coming to the Center for Continuation Study next week to study everything except Hospital Administration. Representatives from technology, social welfare, economics, rehabilitation, political science, psychology and sociology will meet with them during the four day conference period. Most of the large University Hospitals of the country will be represented. It is the plan of the Administrators' college to have this course serve as a trial for similar programs to be developed in the future. The educational requirements for a hospital administrator vary a great deal. Studies are underway to determine the qualifications of an administrator based on studies of his duties. In a large number of hospitals one of his duties apparently is to take money to the bank. In small hospitals nurses do a good job because of their ability to head up the nursing service. The University of Chicago is the only school offering a course in this field. They require graduation from college (medical or business) for admission. There is also a short course at Northwestern University....May 11,12,13, 1944 the American Public Health Association will sponsor a group of distinguished leaders in the Public Health Field, in a 3-day course at the Center. The 1st day will be devoted to Rehabilitation, with Dean A. Clarke heading the discussions. The Public Health Conference on the 2nd and 3rd days will feature Reginald M. Atwater, Chauncey C. Leake, Charles E. Lyght, Arthur Massey, Haven Emerson, Martha W. MacDonald, Pearl McIvor, George T. Palmer, and Ellis S. Tisdale. Registration fee - \$2.