

# TRAUMA ROUNDS

Montreal General Hospital

## Bumper injuries

**DR. MARTINEZ:** The patient is a 74-year-old gentleman who, while walking across an intersection on Christmas Eve, was hit and knocked down by a car. He sustained injuries only to the lower extremities. On the right side he had a transverse fracture of the mid-shaft of the tibia and a fracture of the head of the fibula with a peroneal nerve palsy. The left knee was grossly swollen and was too painful to permit adequate clinical assessment but a rupture of the medial ligament was suspected; radiographs showed no fracture at this site. At operation the medial collateral ligament of the left knee was found to be completely ruptured through both layers. The anterior cruciate ligament was visualized and was found intact but the posterior cruciate was avulsed from its femoral attachment. The medial meniscus was uninjured but there was a tear of the lateral meniscus. The collateral ligament was sutured and the lateral meniscus was removed. The leg was put in a cast and the postoperative course was straightforward. The tibial fracture was treated initially by closed reduction but the fragments later became displaced and open reduction was carried out, using a Lottes nail.

**DR. GIBSON:** The initial films (Figs. 1A and 1B) demonstrate transverse fractures of the tibial shaft and fibular head through normal bone although the patient has evidence of Paget's disease elsewhere. The radiographs taken after closed reduction (Figs. 2A and 2B) show correction of the original valgus angu-

lation of the distal tibial fragment, but its lateral displacement persists and anterior bowing is now present. Other films (not shown) indicated instability in plaster. After open reduction and intermedullary fixation with a Lottes nail (Figs. 3A and 3B) the position is satisfactory and the fractures are stabilized. Metal fragments are present about the proximal end of the nail, and comminution of the tibia has become evident.

**DR. PERCY:** This case demonstrates a very typical injury. We had three such cases admitted during the same week and they are commonly referred to as bumper injuries. The patient is hit by the bumper or mudguard of a car so that the force is directed through both knees. This patient was hit from the left side and the force carried through to the right knee. This caused a valgus strain to the left knee which resulted in a rupture of the medial ligament, and a varus strain to the right knee. In some cases the lateral tibial plateau may be crushed on the side that receives the blow, when the end of the femur is driven into it as the knee is bent. The force of the impact is also transmitted to the other knee, resulting in a reversal of the injuries, a lateral ligament tear or a medial tibial plateau fracture. The situation is a little different in this particular case because the tibia was fractured on the varus side but he does have an associated peroneal nerve injury.

We first treated it conservatively, hoping that simple closed methods would suffice. In any fracture we must apply the three basic rules of proper apposition, alignment and rotation. As you can see, the apposition was about 50% with the initial reduction and the alignment

and rotation were fairly good. There is a little anterior bowing as Dr. Gibson mentioned, and the position deteriorated with time. The other feature that we look for is rotation because obviously you don't want to have the foot pointing the wrong way. Therefore you have to line up the lower limb with the upper limb to make sure that no such rotation is present.

The second patient we saw with this type of injury had a fractured lateral tibial plateau and a fractured femur. The third was a woman who was hit from the left side and incurred a depressed fracture of the left lateral tibial plateau and a fractured pelvis. These three were seen in the same week.

**DR. CONOCHIE:** Do you think that the fracture of the neck of the fibula (even though it is very high) led to some degree of instability of the tibia? In other words, if the fibular fracture had not been present, do you think that you would have been able to hold the tibia in better alignment in a cast?

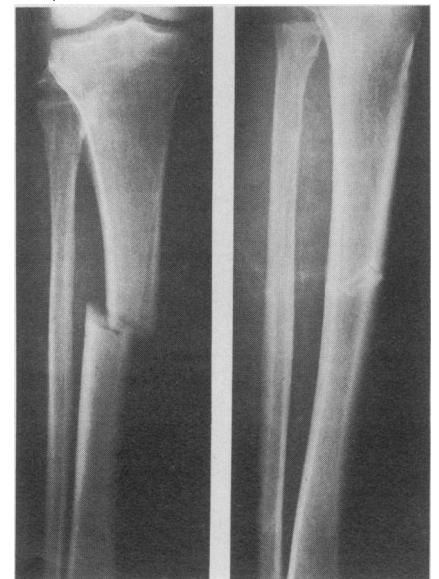


FIG. 1 (A & B)—Initial displacement

DR. PERCY: No. It is pretty unusual to get a transverse fracture like that without gross displacement. If it had been a spiral fracture you might expect an intact fibula. If it is a transverse fracture, obviously the result of a direct blow, the resulting displacement is of such degree that there would have to be an associated fracture of the fibula somewhere.

DR. CONOCHIE: Because of the situation of the fracture, did you consider exploring the peroneal nerve?

DR. PERCY: In this case we were probably justified in not exploring it because there were so many other injuries. It would have been easy to expose the nerve but we thought that probably the best thing would be to reassess it six months later. We will then consider tendon transplants if necessary because the prognosis for recovery of this nerve is not very good at the best of times. Even if you do a decompression, it is often a case of a lesion in continuity (the nerve is torn and the sheath remains intact) and offers a very bad prognosis. We will reassess the patient in three months and see. You do well to bring up this point because the nerve may get bound down in the callus around the fracture site. In this patient I think the nerve is well below and behind the site of

the fracture so it is unlikely that we will have to face this problem.

DR. H. BROWN: Are tibial fractures more difficult to treat if the fibula is intact? Is non-union more common with an intact fibula?

DR. PERCY: You are asking whether the fibula acts as a strut and prevents union from taking place. There is disagreement on this point. There are those who say that an osteotomy should be done and others who claim you are simply letting out the evil spirits by breaking the fibula. In my opinion, osteotomy initially is not necessary, but if there is non-union perhaps it is indicated. In this patient's case we did attempt blind nailing first but this was not successful and accounts for the minor extra fracturing of the tibial shaft. By blind nailing we mean that we try to reduce the fracture and drive the nail down from above without exposing the fracture site. When this was found impossible we had to expose the fracture and introduce the nail under direct vision. The fact that the procedure was not carried out until 10 or 12 days after the injury had been inflicted conferred an advantage in that the rate of healing might be more rapid than if the fracture had been exposed at once. It appears from the radiographs that the nail is a little short. We could have added extra lengths to it and driven it further.

DR. GIBSON: What about the metallic fragments around the upper end of the nail?

DR. PERCY: These represent small fragments of metal which were knocked off during nailing. This does happen and it is unfortunate because there can be a local reaction to the metal. These metals are alloys and therefore a battery type of reaction can occur causing local tissue inflammation and breakdown of the metal. I suspect that when this nail was being hammered into the bone the impactor was not screwed tightly onto the nail so that it stripped off part of the thread. It is possible that it would be better to remove this nail in a year or so when the fracture has healed.

DR. GIBSON: Why did you choose the nail rather than a compression plate, apart from the circumstance that you tried to manage the fracture blindly at first?

DR. PERCY: We tried to do it blindly because we thought we could be successful using a simpler procedure. Having committed ourselves we decided to go ahead with what we had originally planned. At this point quite a period of time had elapsed so that to embark on a different procedure would have greatly prolonged the operation.

DR. GIBSON: For this type of fracture, would you actually advise a Lottes nail rather than a compression apparatus?

DR. PERCY: The compression apparatus is in some disfavor. It produces some necrosis of the bone and there have been cases of refracturing through the screw holes. The apparatus has to be removed when the fracture is healed so perhaps we were justified in using the nail. I am still uncertain as to which is best for the tibia. The Küntscher nail is better for the femur but we have used compression plates in this situation also when there are associated vascular injuries.

DR. BANARJEE: Have you any experience of introducing a square nail into the tibia?

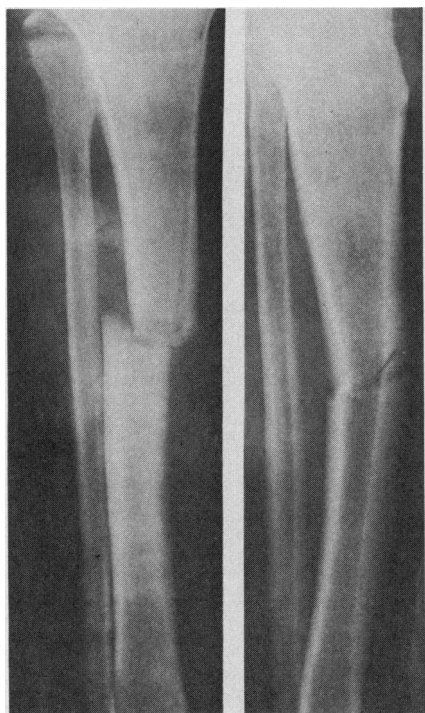


FIG. 2 (A & B)—After closed reduction



FIG. 3 (A & B)—After open reduction and partial healing

# FORTHCOMING MEETINGS

## CANADA

**ANNUAL MEETING, CANADIAN UROLOGICAL ASSOCIATION.** Vancouver, B.C. June 10-13, 1973. Information: Dr. H. W. Johnson, Suite 615, Fairmount Medical Bldg., 750 West Broadway, Vancouver, B.C.

**CANADIAN DIETETIC ASSOCIATION CONVENTION.** Montreal. June 10-14, 1973. "Foods of the 70s". Information: Mrs. L. Desaulniers, 5132 Rosedale Ave., Montreal 265, P.Q.

**CONGRES INTERNATIONAL DE NEURO-CHIRURGIE.** Montréal. Les 14-15 juin. A l'occasion du 25e anniversaire du service de neuro-chirurgie de l'Hôpital Notre-Dame de Montréal. Renseignements: Dr J.-Cartier Giroux, 822 est, rue Sherbrooke, Montréal 132, P.Q.

**31ST ANNUAL GENERAL ASSEMBLY, CANADIAN SOCIETY OF RADIOLOGICAL TECHNICIANS.** Saskatoon. June 18-21, 1973.

**18TH INTERNATIONAL HOSPITAL CONGRESS.** Montreal. June 17-22, 1973. Information: International Hospital Federation, 24 Nutford Place, London W1H 6AN, England

**73RD ANNUAL MEETING, CANADIAN TUBERCULOSIS AND RESPIRATORY DISEASE ASSOCIATION, 15TH ANNUAL MEETING, CANADIAN THORACIC SOCIETY, 10TH ANNUAL NURSES' INSTITUTE.** Calgary, Alta. June 24-27, 1973. Information: Mr. H. E. Drouin, Executive Secretary, CTRDA, 345 O'Connor St., Ottawa, Ont. K2P 1V9

**CONJOINT ANNUAL MEETING OF CANADIAN ASSOCIATION OF PATHOLOGISTS, CANADIAN SOCIETY OF CYTOLOGY, CANADIAN ASSOCIATION OF MEDICAL MICROBIOLOGISTS, PACIFIC NORTHWEST SOCIETY OF PATHOLOGISTS AND B.C. ASSOCIATION OF PATHOLOGISTS.** Information: Dr. A. E. W. Trites, Dept. of Pathology, Shaughnessy Hospital, Vancouver, B.C.

**36TH ANNUAL MEETING, CANADIAN OPHTHALMOLOGICAL SOCIETY.** Toronto. June 24-28, 1973. Information: Dr. G. A. Thompson, Secretary, 1849 Yonge St., Suite 401, Toronto, Ont. M4S 1Y2

**CANADIAN CONGRESS OF CRIMINOLOGY AND CORRECTIONS.** Regina. June 24-29, 1973. Information: Publicity Chairman, Box 3553, Regina, Sask.

**FIFTH INTERNATIONAL HYPERBARIC CONGRESS.** Vancouver. August 20-23, 1973. Information: Program Coordinator, 410-750 West Broadway, Vancouver 9, B.C.

**ANNUAL MEETING, CANADIAN ASSOCIATION OF PHYSICAL MEDICINE AND REHABILITATION.** London, Ont. August 22-24, 1973. Information: Dr. M. G. P. Cameron, University Hospital, Dept. of Rehabilitation Medicine, London, Ont.

**PROPERTIES AND USES OF MATERIAL FOR SURGICAL IMPLANTS.** Special session of 12th Annual Conference of Metallurgists. Laval University. 1:45 p.m., August 29, 1973. Information: Dr. W. N. Roberts, Mines Branch, Dept. of Energy, Mines and Resources, telephone (613) 994-5627.

## UNITED STATES

**WORKSHOP ON UNDERGRADUATE NEUROLOGICAL EDUCATION.** Burlington, Vermont. June 8-9, 1973. Information: Dr. H. Barrows, Faculty of Medicine, McMaster University, Hamilton, Ont.

**SYMPOSIUM ON INSTRUCTIONAL TECHNOLOGY.** Kansas City, Missouri. June 8-9, 1973. Sponsored by American College of Cardiology. Information: Miss M. A. McInerney, Director, Dept of Continuing Education Programs, American College of Cardiology, 9650 Rockville Pike, Bethesda, Md. 20014

**SCREENING AND TREATMENT OF GENETIC DISORDERS.** Chicago. June 14, 1973. Information: Symposium, Metropolitan Chicago Chapter, National Foundation — March of Dimes, 173 West Madison, Chicago, Illinois 60602.

## OTHER COUNTRIES

**III. INTERNATIONAL SYMPOSIUM ON BIOLOGICAL MEDICINE.** Lausanne, Switzerland. June 20-24, 1973. With special reference to Acupuncture. Information: III. International Symposium on Biological Medicine, Chemin du Frêne 11, CH-1004, Lausanne, Switzerland.

**9TH INTERNATIONAL CONGRESS OF PSYCHOTHERAPY.** Oslo, Norway. June 25-30, 1973. Information: Dr. F. Magnussen, Box 26, Vinderen/Oslo, Norway.

DR. PERCY: My experience has been only with the Lottes nail. This is a flanged nail which sits quite securely in the bone. It has three main points of fixation, at the ends and over the curve.

DR. BANARJEE: Do you always use a plaster case with the Lottes nail?

DR. PERCY: You can certainly achieve union without a cast but because of the peroneal nerve palsy and because we had made two incisions, we felt that a cast was indicated. If you had managed to do a blind nailing you might have got away without a cast. I personally always use a cast but there are some surgeons who use a nail without plaster immobilization.

DR. BROWN: In cases of nails inserted for transverse fractures of the tibia, what percentage can go on to delayed or non-union?

DR. PERCY: The reason for opening this fracture was because the alignment was not good, nor was the apposition. In addition, this type of fracture has a high incidence of non-union because the area of surface contact in a transverse fracture is very much less than in a spiral fracture. In a transverse fracture one ring of bone rests on top of another and there is only a small area of bony contact where that bone can heal. This is why such fractures result in non-union. The tibia has an extensive subcutaneous surface without a covering of muscle, where there is less blood supply and very dense bone. The denser the bone the slower the rate of healing. Open reduction provides better bony contact. I can't give you a definite figure for the incidence of non-union.

DR. BROWN: How many of these nails stay in for the patient's lifetime? How many do you have to remove?

DR. PERCY: The nail does not have to be taken out unless there is a definite indication for doing so. One such indication might be that the nail gives rise to discomfort on kneeling. Infection would be an indication for late removal. In this case the metal fragments might justify removal. I would estimate that the percentage that has to be taken out is quite small.

# Dalacin C



**Pædiatric liquid, Capsules, Injectable for prompt control of streptococcal throat infections**

**Indications:** Dalacin C is indicated in infections caused by organisms susceptible to its action, particularly streptococci, pneumococci, and staphylococci. As with all antibiotics, *in-vitro* susceptibility studies should be performed.

## Dosage and Administration:

### DALACIN C CAPSULES

**Adults:** 150 mg\* (one capsule) every six hours.

**Children (over one month of age):** 10-16 mg\*/kg/day divided into three or four equal doses.

### DALACIN C PALMITATE

Flavoured Granules for oral suspension

**Children (over one month of age):** 12-20 mg\*/kg/day divided into three or four equal doses.

\* Depending on the severity of the infection these doses may be increased. See C.P.S. 73 for complete dosage information.

### DALACIN C PHOSPHATE STERILE SOLUTION

#### Adults:

**Intramuscular—**600 to 2400 mg\*\*/day in two, three, or four equal doses. Intramuscular injections of more than 600 mg in a single site are not recommended.

**Intravenous—**900 to 4800 mg\*\*/day by continuous drip or in two to four equal doses, each infused over 20 minutes or longer. Administration of more than 1200 mg in a single one hour infusion not recommended.\*\*\*

#### Children (over one month of age):

**Intramuscular—**10 to 30 mg\*\*/kg/day in two, three, or four equal doses.

**Intravenous—**15 to 40 mg\*\*/kg/day by continuous drip or in three or four equal doses, each infused over 20 minutes or longer.\*\*\*

\*\* Depending on the severity of the infection.

\*\*\* Dalacin C Phosphate Sterile Solution should not be given undiluted intravenously; always administer in an infusion. See product monograph supplied with each vial for complete dosage information and infusion rates.

Absorption of Dalacin C is not appreciably modified by ingestion of food and Dalacin C may be taken with meals with no significant reduction of the serum level.

**Note:** With  $\beta$ -haemolytic streptococcal infections, treatment should continue for at least ten days to diminish the likelihood of subsequent rheumatic fever or glomerulonephritis.

**Cautions:** Generally well tolerated. Usual antibiotic side effects — abdominal discomfort, loose stools or diarrhoea, nausea, vomiting. Transient neutropenia (leukopenia), or abnormalities in liver function tests have been observed in a few instances. Mild hypersensitivity reactions (skin rash and urticaria) have been observed on rare occasions.

Use with caution in patients with a history of asthma and other allergies. As with other antibiotics, periodic liver function tests and blood counts should be performed during prolonged therapy.

Not indicated in patients who have demonstrated sensitivity to lincosamycin. Safety in pregnancy not established. Dalacin C is not indicated in the newborn.

## Availability:

**Capsules 150 mg** — Each capsule contains clindamycin hydrochloride hydrate equivalent to 150 mg clindamycin base. Supplied in bottles of 16 and 100.

**Pædiatric Capsules 75 mg** — Each capsule contains clindamycin hydrochloride hydrate equivalent to 75 mg clindamycin base. Supplied in bottles of 16 and 100.

**Pædiatric Liquid Dalacin C Palmitate Flavoured Granules for oral suspension** — After reconstitution with the quantity of distilled water indicated on the label, each 5 ml contains clindamycin-2-palmitate hydrochloride equivalent to 75 mg clindamycin base. Supplied in 60 ml and 100 ml bottles.

**Injectable Dalacin C Phosphate Sterile Solution** — Each ml contains clindamycin-2-phosphate equivalent to clindamycin base 150 mg, in 2 ml ampoules.

Detailed information available on request.

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