

Osteotomy cervical spine under local anaesthesia

By Patricia Ann Fleming, R.N.

A 47 year old semi-retired truck driver with long standing ankylosing spondylitis was admitted to St. Joseph's Hospital, London for a very challenging and unusual operation. His chief complaint was a functional disability related to his inability to see ahead of him. (Fig. #1)

History

He really had two deformities, one in his cervical spine and one in his lumbar spine, but his predominant problems for which he was seen in hospital were for his cervical and upper thoracic kyphosis. The event which preceded his current disability occurred ten months prior when he fell backwards while descending stairs and then off a ledge approximately six feet onto his neck and shoulders. He undoubtedly sustained a fracture of his cervical spine at the time of the fall and this is a

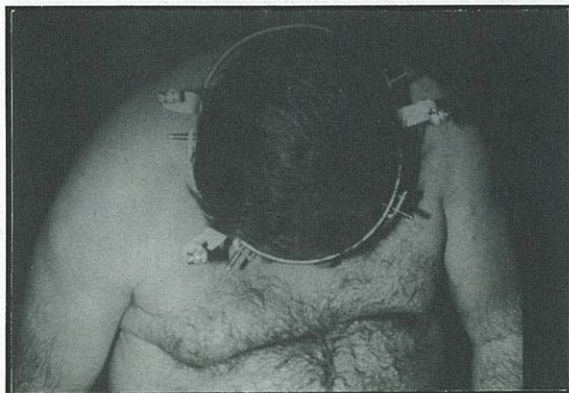


Figure #1 - Presenting with longstanding ankylosing spondylitis, the patient had a falling mishap sustaining a fracture of his cervical spine. Note the chin-on-chest deformity and the Halo ring as well as the hunching of the upper back.

known occurrence in patients who have ankylosing spondylitis.

On admission he virtually had no movement of his neck. He could flex his lower lumbar spine so that his hands touched his knees, but no further. There was almost no extension or lateral-rotation of his lumbar spine and he presented with a "chin-on-chest" deformity of one finger breadth secondary to cervical kyphosis (hunchback). (Fig. #2 and #3)

This rigid deformity limited his ability to ambulate, to see the ground more than two feet in front of his feet, and eating became increasingly laborious.

Physical examination

A pre-operative physical examination by the medical staff confirmed a marked "chin-on-chest" deformity, with a 90° flexion fixed deformity, secondary to cervical kyphosis. There were no neurological abnormalities with the exception of bilateral ulnar neuropathies.

This 47 year old agreed to a cervical osteotomy to correct his cervical deformity, fully understanding

About the author

Patricia Ann Fleming, R.N., has 15 years of operating room experience and is currently the Head Nurse, Operating Room, Woodstock General Hospital.



When this article was written, the author was the Clinical Instructor, OR and RR at St. Joseph's Hospital, London, Ontario. Ms. Fleming, who has completed the Nursing Unit Administration Program, is a part-time student at University of Western Ontario. She is president of the London and District OR Nurses Group.



WECK



A Special Offer from Weck of General Instruments
from now until April 30th, 1988!

Offre spéciale instruments chirurgicaux de Weck
en vigueur jusqu'au 30 avril 1988!

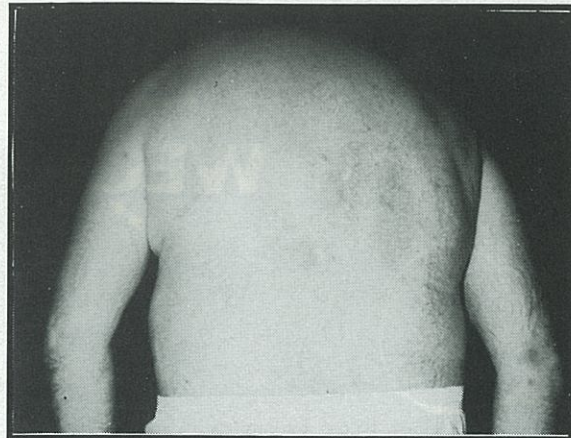


Figure #2 - Upon admission, the patient had virtually no movement of his neck. There was also no extension or lateral rotation of his lumbar spine.

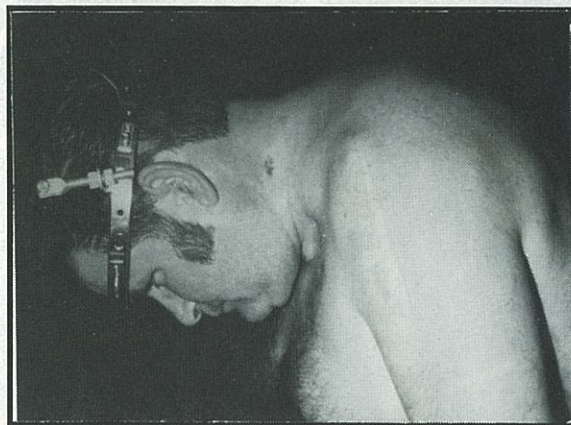


Figure #3 - This was the perspective of the patient shown with halo ring attached: unable to see more than two feet in front of his feet, with eating an extremely laborous task.

the risks which could include: death, upper motor neuropathies, both complete and incomplete quadriplegia and lower motor neuropathies consisting of nerve root problems which are real and common complications.

Application of halo ring and vest

Ten days prior to the osteotomy surgery, the patient was admitted on an out-patient basis for application of a halo ring under local anaesthesia. The vest, which required modification due to his severe flexion deformity of the cervical spine, was then applied. (Figure #4)

This out-patient arrangement enabled the patient

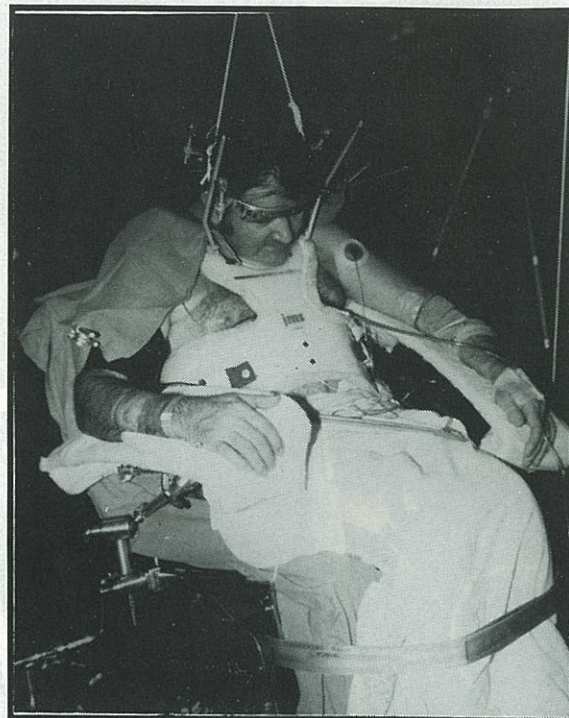


Figure #4 - The patient with halo and vest applied. In this position, in an awake state, the surgery was performed.

to become acquainted with the osteotomy surgery to come. It was also the time to familiarize the patient with the experience that would see him immobilized in the post-operative period for approximately twelve weeks.

Anaesthesia concerns

The surgery was performed in an awake state. The reason for this was that when the patient's cervical spine was cracked, the surgeon wanted to be sure the patient didn't suddenly get into significant neurological problems related more to root problems than the cord problems. If there was any hint of problems the surgeon would then back off immediately. The patient, therefore needed to be awake to inform the surgeon if he felt any tingling sensations in his extremities.

As a result, the anaesthetist faced some considerable concerns. Firstly, the pain had to be dealt with by local infiltration and carefully titrated with intravenous sedation. Secondly, the sitting position caused the possibility of air embolism. If the patient was to arrest in such a position, resuscitation measures would be difficult. Finally, intubation

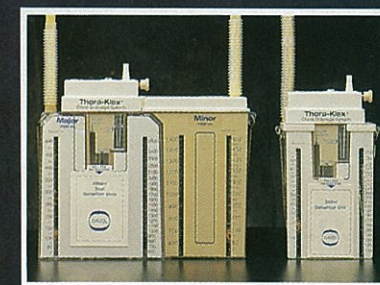
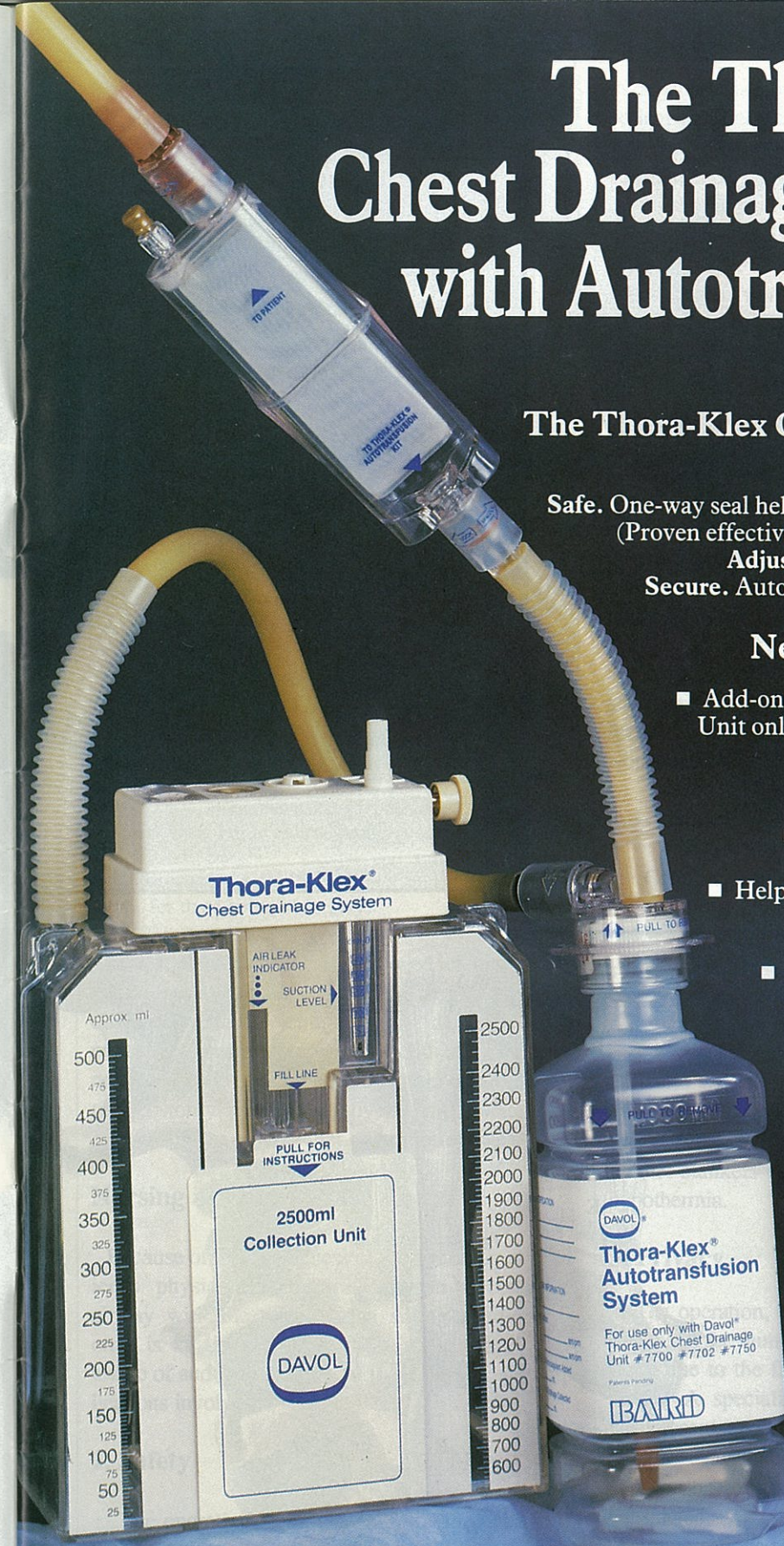
The Thora-Klex[®] Chest Drainage System with Autotransfusion

The Thora-Klex Chest Drainage System

- Fast.** Sets up in 60 seconds.
- Safe.** One-way seal helps protect even if unit is tipped. (Proven effective over 10 million patient hours).
- Adjustable.** Variable suction control.
- Secure.** Automatically vents excess pressure.

New Autotransfusion Kit

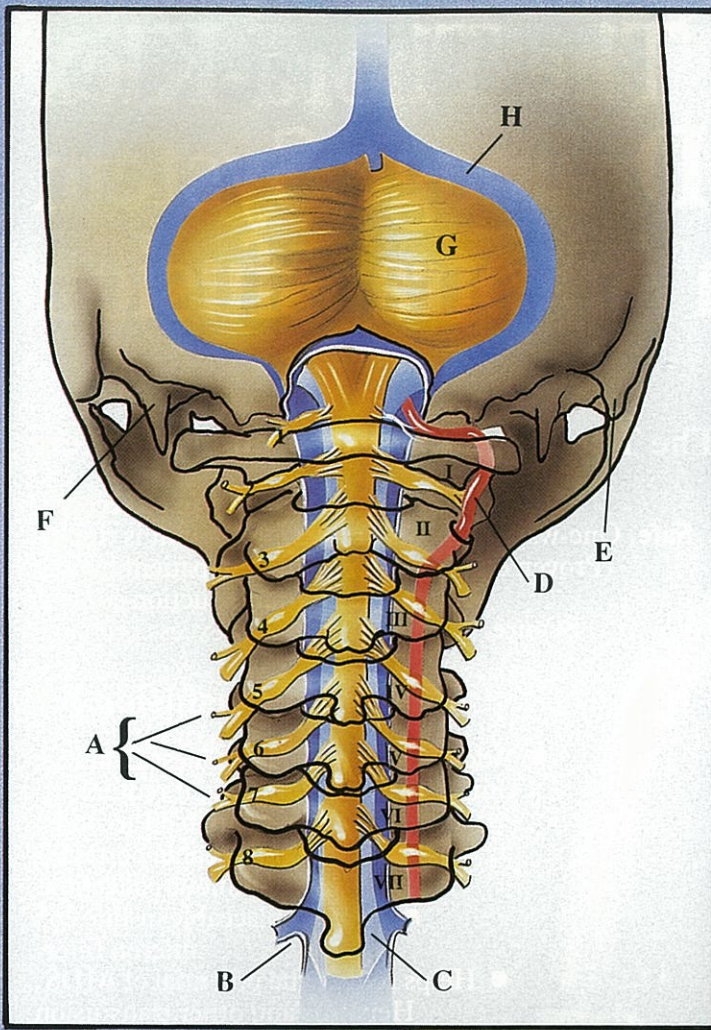
- Add-on to Thora-Klex Chest Drainage Unit only when your patient requires it.
 - Sets up in 30 seconds.
 - Easily replaceable bottle for continuous collection.
 - Easily replaceable in-line 265 micron filter.
- Helps reduce the potential of AIDS, Hepatitis and other transfusion related infections.
- Helps reduce demand on blood bank supplies.



Also available in 4,000 ml dual and 350 ml.



Anatomy of the cervical vertebrae back view



- A. 1 - 8 cervical nerves
- B. Dura and arachnoid
- C. Denticulate ligament
- D. Vertebral artery
- E. Mastoid process
- F. Styloid process
- G. Cerebellum
- H. Transverse sinus

Cervical vertebrae with ligaments front view

- A. Base of skull
- B. Anterior longitudinal ligament
- C. Atlanto - epistrophic ligament
- D. Lateral atlanto - occipital ligament
- E. Articular capsule
- F. Anterior atlanto - occipital ligament

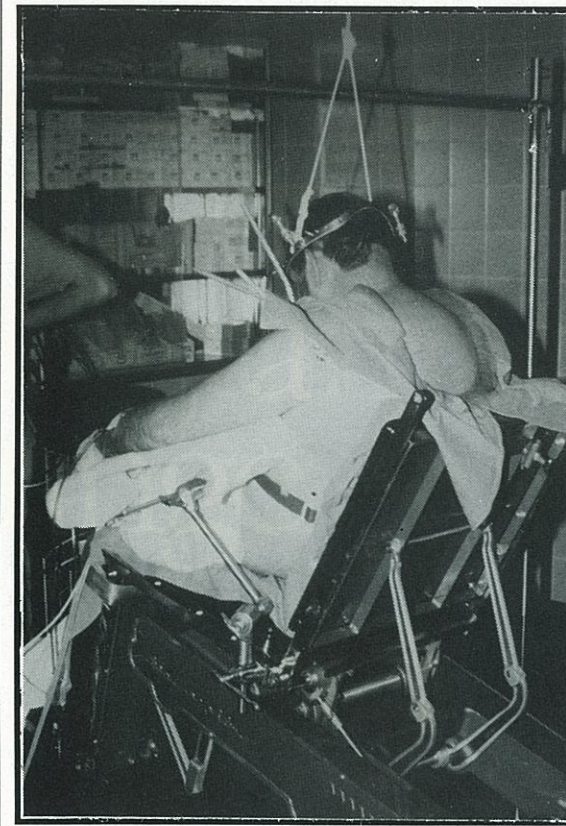
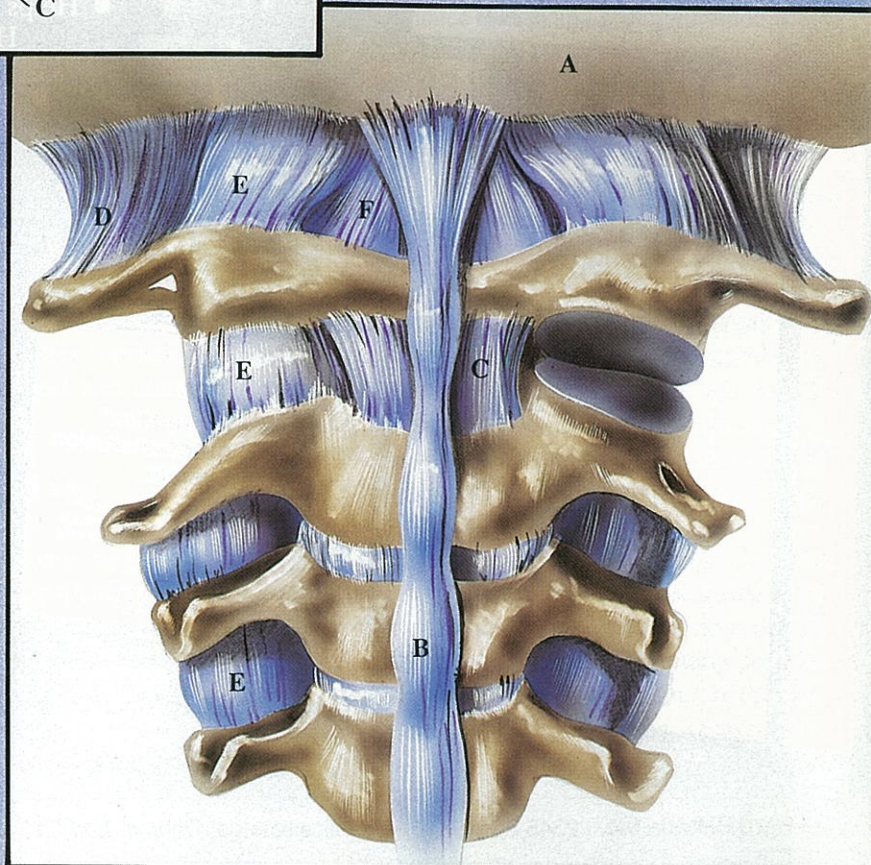


Figure #5 - From the halo, 15 pounds of traction were attached from an overhead ceiling support. Note that the hairline has been shaved and the neck prepped. The patient is in this position, under local anaesthesia, for three hours of surgery.

was not performed due to the need of maintaining the patient awake, but if required would have been difficult due to his "chin-on-chest" deformity. The patient was unable to open his mouth and extend his neck. In fact, because of the patient's deformity, a tracheostomy would virtually be impossible. The anaesthetist was faced with an uncontrolled airway.

Nursing implications

Because of the uniqueness of the operation, the patient's physical disabilities, and an uncontrolled airway with the patient in a sitting position, the onus is on the operating room nurse to be fully aware of and appreciative of the many nursing implications involved:

1. Safety

The operating table, not properly equipped to do so, was adjusted to accommodate surgery performed

in a sitting position. Therefore, to maintain the patient in a secure position, restraining straps, arm rests, back support, and a foot support were required. Regular knee straps were used across the chest and across the thighs of the patient. Arm rests normally used in chest surgery were attached to the O.R. table on either side. After elbow pads were applied, the patient's arms were placed in these arm rests but not secured, to allow the anaesthetist to monitor his neurological status. The table's padded foot piece was installed at a 90° angle enabling the patient to comfortably rest. (See Fig. #4 previous page)

An adequately stocked cardiac arrest cart was available and staff was made aware that resuscitation measures could be difficult due to the patient's physical features.

At completion of surgery, the patient was expected to transfer himself from the O.R. table to his hospital bed. Due to the fact that he would have been in a sitting position for three hours, had received sedation, just experienced major surgery, and was wearing a halo and vest, assistance in the form of strong, supporting and weight-bearing staff would be required.

2. Comfort

Comfort becomes a concern with the patient on an operating table for three hours and unable to move with 15 pounds of traction applied to his halo by an overhead ceiling support. (Fig. #5) Another factor causing concern is that a clear plastic surgical drape is used in place of linen drapes resulting in exposure of patient and heat loss.

Sheepskin, pillows, and foam padding were used to prevent skin breakdown and to supply comfort. The heat in the theatre was increased and warm flannel blankets were offered in attempts to prevent hypothermia.

3. Privacy

The operation, being unique, resulted in the need to control the number of staff present. This was difficult due to the fact that St. Joseph's is a teaching centre. A specialist from John Hopkins Hospital was present, and the entire operation itself was being videotaped. Nevertheless, the patient's privacy and maintenance of adequate infection control had to be considered.

Conversations and extraneous noises were limited

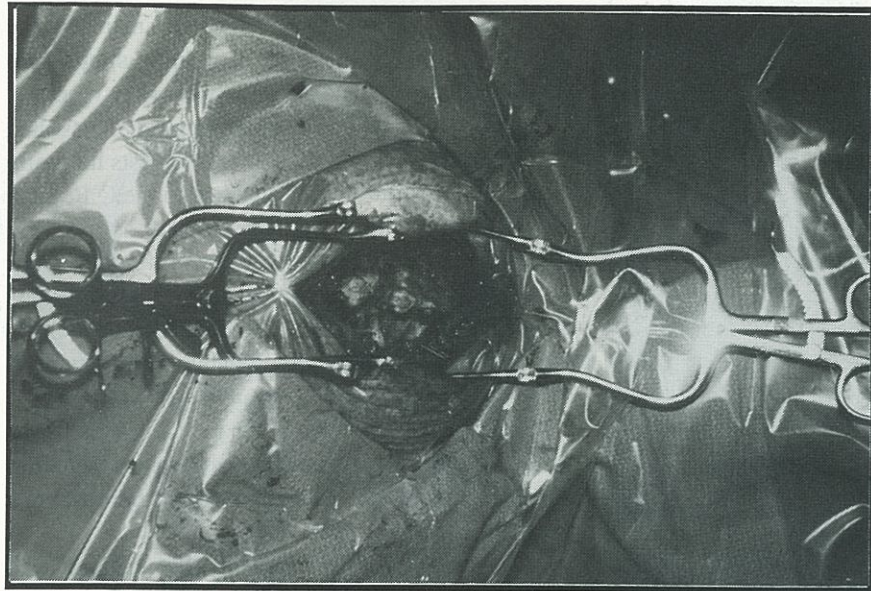


Figure #6

After the incision, retractors are used to expose the dorsal laminae of C5 to T1 for a complete laminectomy of C7 and a partial laminectomy of C6.

so the anaesthetist and the surgeon could verbally monitor the patient's condition. The patient was aware of the surgical progression and could respond to commands given by the anaesthetist such as moving toes and fingers to determine neurological status.

4. Support

Due to the possible risks and complications associated with such surgery, feelings of anxiety, fear, and apprehension would be expected. Being with the patient constantly through the surgical process and meeting his emotional and physical needs, would be expectations of the O.R. nurse.

The surgery

Following introduction of a central line, the patient voluntarily transferred himself to the O.R. table. Once secure and comfortable, the posterior hairline was shaved and the neck prepped. (See Fig. #5 on previous page)

Local anaesthesia of the skin and paraspinus musculature was achieved with .25% Marcaine with Adrenalin. A 15 cm midline incision was made extending from C5 to T2. For hemostasis, electrocauterization was used. After completely exposing the dorsal laminae of C5 to T1 a complete laminectomy of C7 and a partial of C6 was performed. (Figure #6)

The spinal cord and dural sac were decompressed inferiorly allowing a partial superior laminectomy of

T1. This laminectomy was then extended laterally generously exposing the C8 nerve roots bilaterally. The facets between C7 and T1 were removed and laminectomies of C6 and T1 were bevelled, minimizing impingement of their superior and inferior aspects on the cord.

All bone from laminectomies was saved in moist gauze and used along with fresh tibial cancellous bone as allograft bone grafting at the completion of the osteoclasia (surgical fracture of bone in order to remedy deformity).

A controlled corrective osteoclasia was performed using gentle cephalad and posterior directed pressure while the surgeon exerted counteraction on the thorax. Buckling of the cord was observed and the left C8 nerve root appeared to be compromised. The patient volunteered some tingling sensation in the ulnar distribution of the left hand. A slightly wider C8 foramenotomy was then performed to prevent impingement and the corrective osteoclasia surgery was completed with no further neurological loss.

The autogenous bone graft pieces were applied over the lateral aspects of the facets and dorsal lamina providing a posterior bone graft. The wound was irrigated, a wound drainage system inserted, and the wound closed.

Post-surgical assessment

With an apparent 45° correction of the cervical osteotomy the patient could visualize the operating room and staff directly in front of him as opposed to

From simple to sophisticated, Ingram & Bell has a finger on the pulse.

In a profession where change and technological advances are a way of life and a way of preserving life, a supplier who keeps pace with the latest developments in new product design and manufacturing technique is vital.



FROM THE SIMPLICITY OF A SYRINGE...

Scale-tronix weighing systems; Gaymar decubitus pressure treatment products and Biomet ortho-



...TO THE SOPHISTICATION OF A VIDEO ENDOSCOPE.

pedic products and total systems. These names reflect Ingram & Bell's commitment to outstanding quality and product scope.

Our coast-to-coast distribution facilities bring this vast range of products as close as your fingertips.

Call one of our professional representatives today. When you need us, we're there.

We offer products designed to meet the needs of the Canadian market and include among them some of the most technically advanced in the industry. Some examples are Fujinon's video endoscopy system which produces resolution almost three times that of the best fiberscopes; Marquette systems, the most advanced ECG and patient monitoring technology;

INGRAM & BELL MEDICAL

Serving the Canadian health care professional for over 80 years.

20 BOND AVE., DON MILLS
ONTARIO M3B 1L9
416-444-7381

his proximal thigh prior to surgery. His neck appeared to be restored to its normal posture. A normal neurological examination was exhibited with the exception of a weaker grasp in the left hand.

On completion of surgery, the patient voluntarily walked to his hospital bed with assistance. He spent one night in the ICU then transferred to the orthopaedic floor.

Six-month follow-up

A successful recovery without complications followed the cervical osteotomy. The patient's cervical spine went on to a solid union but lost a little of the original correction obtained in the operating room. He is clinically maintaining a good four-finger breadth between chin and chest and is quite pleased with the outcome.

To correct his considerable thoracic round back resulting from his second deformity involving his lumbar spine, a thoraco-lumbar type osteotomy correction is being considered.



The Author thanks Dr. R. J. Hawkins and Dr. J. D. McKishnie for their assistance.

Bibliography

McMaster, M., "Technique for Lumbar Spinal Osteotomy in Ankylosing Spondylitis," *J. of Bone and Joint Surgery*, March '85, 67B(2), pg. 204 - 210.

Resnick, D., and Niwayoma, G., "Diagnosis of Bone and Joint Disorders," (Vol. 2); Philadelphia, W. B. Saunders Company, 1981.

Simmons, E. H. "Kyphotic Deformity of the Spine in Ankylosing Spondylitis," *Clinical Orthopaedics and Related Research*, October, 1977, (128), 65-77.

Turek, S. L., "Orthopaedic Principles and their Application," (4th ed.) Philadelphia, J. B. Lippincott Company, 1984.

Becton Dickinson appoints Jon Schoeler vice president of sales and marketing

Becton Dickinson Canada Inc. has announced the appointment of Jon Schoeler as the new vice president of sales and marketing for the Becton Dickinson Medical Group. He will be responsible for marketing programs and field sales in the company's Hospital/Medical and Deseret divisions.

Schoeler has extensive experience in the health care industry, in production, marketing and sales management. He is a graduate of the University of Toronto with a B.Sc. in industrial engineering.

Speakers for the Greater Toronto OR trauma seminar announced

The Operating Room Nurses Association of Greater Toronto (ORNAGT) have announced the speakers for its up-coming one day seminar on "Trauma for Operating Room Nurses."

The seminar is to be held on April 16 at the Toronto Convention Centre. The agenda of seminar speakers is as follows:

• "Certification and Specialization"

Speaker, Margaret Fitch, Ph.D., Director of Nursing Research, Professional Development, Toronto General Hospital

• "The ABCs of Trauma Management"

Speaker, Dr. Kellan, M.D., F.R.C.S.(C), F.A.C.S., Sunnybrook Medical Centre, Toronto.

• "Multiple Facial Fractures"

Speaker, Dr. Phillips, M.D., F.R.C.S., Sunnybrook Medical Centre, Toronto.

• "The Role of the OR Nurse in Organ Donations"

Speaker, Holli McLennan, RN, University Hospital, London, Ontario.

• "Technical Aspects of Organ Retrieval"

Speaker, L. Roy Beimuts (M.O.R.E.), Transplant Co-ordinator-Programmer.

"The Medico-legal Issues of Organ Retrieval"

Speaker, Dr. John Carlisle, Registrar Director of Professional Assessment for the College of Physicians and Surgeons.

Readers should note that registration is limited to 100 delegates. Look for registration forms, which will be sent to regional hospital operating rooms. Registrants outside this area are asked to call Elizabeth Jones at (416) 733-3054.

Isabelle Adams Award to be given to outstanding Canadian O.R. nurse

The Operating Room Nurses Association of Canada intends to honour outstanding Canadian nurses at each national conference.

The "Isabelle Adams Award for Excellence in Perioperative Nursing" will, for the first time, be awarded at the 1988 National O.R. Conference scheduled for the Pan Pacific Hotel in Vancouver.

Awards Committee chairman for ORNAC, Muriel Shewchuk, asked the O.R. Journal to publicize the availability of this award. Applications and award criteria can be obtained from:

Awards Chairman, #5010 Dalhousie Dr. N.W. Calgary, Alberta T3A 1B4

Canadian nurses participate in World OR Conference in Singapore

The World Conference of Operating Room Nurses concluded its 5th biennial gathering this past September in Singapore. Total registration was 1,313, with 63 Canadian O.R. nurses in attendance.

There were 36 countries represented at the conference. Australia could boast the most registrants per capita with 212. Other large contingents were from the U.S. (322), Canada (63), Great Britain (19), France (14), Italy (76), Japan (110), New Zealand (20), Netherlands (10), Philippines (16), Singapore (88), South Korea (18), Taiwan (21), Malaysia (16), Denmark (10).

The week-long gathering had over 30 major educational/clinical topics on the agenda. Canada was represented with six speakers:

• Beverly Schmocker, Mt. Sinai Hospital, Toronto ("Laser Technology");

• Gloria Stephens, St. Paul's Hospital, Vancouver ("Management of Disaster Situations");

• Marvelle McPherson, St. Boniface General Hospital, Winnipeg ("Power: Personal and professional");

• Judy Wry, University of Alberta Hospital, Edmonton ("Time Management");

• Margo Fretz and Holli McLennan, University Hospital, London ("Transplant Surgery").

Vienna, Austria - 1989

The site for the 6th World Conference of Operating Room Nurses, to be held from August 28 to September 1, 1989, is Vienna, Austria. Details of

this event will be published in the journal as they are made available. The World O.R. Conference, one of the largest specialty nursing gatherings in the world, is sponsored and organized by the Association of Operating Room Nurses, Inc., Denver, Colorado.

A pedicab provides the foreground (photo below) for this group of Canadian operating room nurses attending the 5th World O.R. Conference. The occasion was the Johnson & Johnson Hospitality Night at Raffles Hotel in Singapore.



Canadian delegates to the World O.R. Conference in Singapore assembled for this photo (below).

