

Table 6

Average survival time and treatment of non-resected cases 1948-67

Treatment	No. of operation survivors	Average survival time (years)	% expected survival
Nil	40	0.3	2.3
Curettage	7	1.2	22.0
Laparotomy	31	0.4	2.1
Irradiation	10	0.6	3.3
Colostomy	50	0.6	3.4
Colostomy and irradiation	8	1.0	5.6
Miscellaneous	27	0.8	4.9

high survival time of those few patients whose growths were curetted (22.0% of expectation) is due to their advanced ages combined with the possibility that the tumours were relatively early. There is no indication that any particular treatment prolonged life greatly.

The survival rate of palliative excision cases showed little relationship to the type of operation and varied only between 15.5 and 20 months (8-10% of expectation). About 10% of these patients received secondary treatment (mostly irradiation) for recurrent carcinoma. Those without such further treatment survived an average of 16.8 months as against 21.5 months for those receiving secondary treatment. However, since the latter group was younger, the proportion of expected survival was roughly the same for both groups (9.3 and 8.7% respectively).

Comparison of Survival Time in First and Second 20-year Period

The average survival time for every patient seen in the first 20-year period, including operation deaths entered as zero survival, is 5.7 years per patient or 33.8% of expected survival. Estimation of the expected average survival time of patients in the second 20 years gives 7.5 years per patient or 46.0% of normal. The average has thus increased by 1.8 years or about one-third. This improvement has come about by reducing the inoperable group to 5% of the total cases and by lowering the operation mortality to 3%. Further improvement in survival time by these means is not likely, and hope for the future rests on more efficient treatment by radiotherapy and chemotherapy, but most of all on diagnosis of rectal cancer at an earlier stage.

Conclusions

- (1) Originally constituting about half the total patients, advanced cases have now been reduced to about one-quarter, of which 5% are inoperable and 20% have palliative excisions.
- (2) The average survival time of the patient with non-resectable rectal cancer is 0.6 years, and of the palliative excision cases 1.4 years, compared with 9.9 years for radical excision cases.

(3) During the past 40 years, the average time of survival per patient has increased from 5.7 years to 7.5 years.

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Anterolateral Chordotomy for Intractable Pain in Carcinoma of the Rectum

In the management of intractable pain due to pelvic carcinoma the ideal procedure should produce lasting relief of pain, should occasion no unwanted sequelae and should in itself cause no further suffering. No such procedure exists but stronger analgesic drugs, chemical nerve block and anterolateral chordotomy all have their place in helping these patients. My personal experience has been greatest with the operation of anterolateral chordotomy. This is the most powerful pain-relieving procedure available and I should like to make a brief review of my experience of the operation to form a basis for some more general remarks.

The operation of anterolateral chordotomy has been carried out 116 times, 19 in the cervical and 97 in the dorsal regions. All except one of the cervical operations were unilateral and all except two of the dorsal ones were bilateral. The usual indication for cervical chordotomy has been intractable pain due to carcinoma of the breast or lung. Dorsal chordotomy was indicated by pain due to pelvic malignant disease in 72% of the cases, with carcinoma of the rectum the commonest underlying disease in the whole group and in men, and the second commonest cause in women. The remarks which follow are based on an analysis of the records of the first 56 patients who were subjected to dorsal anterolateral chordotomy for intractable pain secondary to pelvic malignant disease. The reason for this limitation of the number of cases reviewed is the fact that the figures for these cases are readily available in previous publications (O'Connell 1959, 1961).

Two patients died within four weeks of the operation (mortality 3.68%) and are excluded from consideration, since pain relief of this duration is not sufficient to justify the procedure. In 34 (63%) of the remaining 54 patients relief was complete and persisted until the

patient died or was lost to follow up. The duration of relief was, for the most part, governed by that of the patients' post-operative survival and was greater than three months in two-thirds of the group. In 19 patients (35%) pain relief was either incomplete or if initially complete did not persist. In two patients in this group pain developed on the opposite side after a successful unilateral chordotomy; in the remaining 17 patients, initial complete relief lasted for less than six weeks in 8 patients and from six weeks to two years in 9, the recurrence being associated with patchy return of pain sensibility in the previously analgesic sacral dermatomes. In many of these patients pain remained at a much reduced level for long periods. Finally, in one patient the operation produced no relief. These figures indicate that the survival period after operation and the relief of pain achieved made the operation of real value in this series of patients.

Unwanted effects are frequent after bilateral anterolateral chordotomy. The most important of these concerns micturition. In 13% this was persistent, with retention or incontinence; in 18% voluntary micturition was restored but with considerable residual urine; in 68% apparently normal voluntary micturition returned but precipitancy and occasional incontinence might occur. Furthermore, with progression of the disease and deterioration of the patient's condition, loss of voluntary control might recur. Where the rectum has not been excised this loss of rectal and perineal sensation may lead to rectal incontinence. Weakness of a lower limb occurred in 11%, with some residual loss of power in half of these. The combination of analgesia in the pressure areas and malnutrition predisposes to the development of pressure sores, not only in the immediate post-operative period but also after discharge.

Why should it be difficult regularly to ensure permanent pain relief and at the same time avoid undesirable sequelae following the operation of chordotomy? Firstly, the fibres which carry pain sensation occupy a wide area in each anterior quadrant of the spinal cord. All of this, excluding a medial strip, must be sectioned if lasting analgesia is to be produced on the opposite side of the body. The necessary incision will occasionally injure fibres in the anterior portion of the corticospinal tract with the production of a paresis of the ipsilateral lower limb. More important is the fact that, as shown by Nathan & Smith (1951, 1953), in the posterior portion of the anterior quadrant of the cord lie the nerve fibres passing to and from higher levels to the centres in the sacral segments concerned with micturition and defæcation. These are inevitably sectioned in an adequate chordotomy incision with the

results already described where the incisions are bilateral. Thus an incision which is too limited will not produce adequate analgesia and will fail to relieve pain permanently; and an incision which is adequate will inevitably, even though temporarily, disturb the control of micturition and defæcation and will sometimes also occasion weakness of a lower limb. While the risks of these sequelae do not rule out this operation, they must be carefully borne in mind when selecting patients for it.

The third requisite of an operation for intractable pain in patients with malignant disease is that it should in itself occasion a minimum of additional suffering. Here again in the case of chordotomy the goal is not attainable but careful technique can minimize the ordeal for the patient and general anaesthesia should be employed; the value of sensory testing carried out during operation under local anaesthesia has been exaggerated. Limiting the extent of the laminectomy to two neural arches will diminish post-operative pain. It has been suggested that separation of the incisions on the two sides of the cord in space, which requires a wide exposure, diminishes the risks of sphincter disturbance. There is little evidence that this is so and the extended exposure is not justified. Nor, for the same reason, is there indication for separating the incisions in time by cutting each anterior quadrant of the cord at successive operations. Good nursing can further minimize post-operative suffering.

Obviously the selection of patients for chordotomy is important. Experience of what operation can achieve and at what cost facilitates this selection. The operation is indicated when pain is clearly severe and where the patient's general condition is such that there is a life expectancy of at least three months. The operation is contra-indicated when the severity of pain is in doubt. Some patients will accept operation in the mistaken belief that it is designed to cure their disease; the unhappiness of others may stem from a number of causes other than pain—for example, failing strength, fistulae or an enlarging tumour. Operation should be avoided in both these groups and also when the patient's general condition shows rapid deterioration. Where pain is of limited extent and severity and where deterioration is rapid much benefit can be achieved by nerve root blocks; later on, stronger analgesic drugs should of course not be withheld.

In conclusion I believe that the operation of chordotomy when well timed and efficiently performed in selected cases can lead to great relief of suffering. The balance between the success and failure of such an operation in these patients in the late stages of malignant disease is a fine one.

Careful individual consideration of each patient is therefore essential if the procedure is to be considered worthwhile.

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General Management of Intractable Pain in Advanced Carcinoma of the Rectum

There are general problems in treating advanced malignant disease of the pelvis. The patient may be very well above the waist but suffer pain and disability below this level. The terminal care phase can seem very lengthy to the patient, especially if the medical and paramedical attention is inadequate. The patient requires to be assessed physically, mentally and socially, and management should be carefully directed as specifically as possible.

Drugs are the main stand-by of treatment and should be used in the context of the assessment. Among the analgesics oral methadone is an especially valuable drug. Tranquillizers may be doubly useful if they have anti-emetic effects. The antidepressant effects of steroids may be helpful or more specific drugs such as amitriptyline can be used. Hypnotics may include alcohol. Diuretics may help the swollen leg. Aperients are often the most acceptable group of drugs.

Simple psychotherapy is valuable in terminal illness and hypnotherapy may be worthy of trial if the practitioner is interested and the patient receptive. Hypnotherapy may vary from mild relaxation to removal of painful sensations. Good medical social welfare is vital in order to utilize all the available social benefits, both voluntary and of the National Health Service.

Nerve blocking may be worth considering. The intractable pain is usually in the sacral and lower lumbar root distribution. Local anaesthetic blocks give a diagnostic and prognostic indication of the likely relief of pain, and on occasion they are successful for days or weeks. In a series of 80 patients with pelvic cancer and with lumbosacral root pain, nearly half were managed with drugs and/or local anaesthetic blocks. Seven patients in this series had a total of 13 intrathecal blocks with hypertonic saline, but none had lasting relief of pain. This is best done under a general anaesthetic as it is an uncomfortable procedure for the patient.

Thirty-seven patients had 83 blocks with intrathecal phenol, and 4 patients had 7 blocks with intrathecal alcohol. The patient was usually conscious during these injections, but general anaesthesia should be considered if the patient finds the position required for the injection painful, or difficult to achieve and hold while the neurolytic agent fixes. The complicating risks of these blocks are paraesthesia, proprioceptive loss, motor paresis due to involvement of motor roots, and sphincter disturbance. Only 3 patients had complications which they reckoned severe, and they were not aware of their prognosis. There were 20 patients who had complications of a mild nature. Sixteen patients were classified as having good relief of pain from the intrathecal alcohol or phenol blocks, 23 were rated as having a satisfactory relief of pain, and 2 patients said they had no relief. Because of this latter small group it may be worth doing a spinal anaesthetic first to establish whether the intractable pain is relievable by an intrathecal chemical nerve blocking agent in the lumbosacral area. Two patients were referred for anterolateral chordotomy after phenol blocks.

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The Use of Chemotherapy in Advanced Carcinoma of the Rectum

At the present time, the use of specific anti-tumour agents in the management of patients with advanced rectal cancer is very disappointing. No drug has yet been identified which will reliably retard or reverse the growth of adenocarcinoma of the gastrointestinal tract. Some of the drugs currently available will produce an effect in certain patients but the responses are not predictable and often only short-lived. I have reported previously findings concerning the blood supply of primary tumours of the large intestine and the accessibility of drugs to them (McKinna 1967, Smart 1968). In particular there are large areas in the centre of many of these tumours which are not easily reached by cytotoxic drugs even when they are administered by close arterial injection. These findings must be applicable to the extensive pelvic disease of the advanced primary tumour or of the recurrent case and, in the face of a poor therapeutic response, chemotherapy must be related to the other treatments available and particularly to palliative surgery.