THE MANAGEMENT OF PAIN OF MALIGNANT DISEASE WITH NERVE BLOCKS *

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ANALYSIS OF CLINICAL MATERIAL

During the past several years, we have been interested in the management of pain resulting from nonsurgical diseases and have devoted much of our time to this phase of anesthesiology. Of particular interest has been the management of intractable pain of causalgia, neuralgia and malignant disease. Our activities have stimulated a great deal of interest among clinicians of our community and consequently we have been afforded the opportunity of managing a large number of cases. All of the results of these experiences are being published elsewhere (19).

In the past five years, 194 patients with intractable pain of neoplastic disease have been managed with nerve blocks. The results are presented in tables 3, 4, 5, 6 and 7. The following general explanations are necessary.

Since the pain frequently involved structures supplied by more than one branch of the same nerve or more than one nerve, several block procedures were often done at the same time. In such instances the procedure is counted as one, regardless of the number of nerves injected.

Relief was recorded after an adequate interval following each procedure and when the patient was discharged from the pain clinic. The patient was asked to state whether the pain was 0, 25, 50, 75 or 100 per cent relieved. Since this is usually a difficult question for the patients to answer because they cannot objectively evaluate the degree of pain before and after the block, their answers were carefully corroborated with the observations of the nursing, resident, and attending staff regarding the amount of opiates or other analgesics necessary and with the complaints of the patient and the objective evaluation of the patient's comfort. Most of the patients were followed at home by the

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anesthesiologist or the patient's physician, or both. In the tables the results recorded are those at the end of the entire treatment. Relief was considered *complete* if well over 75 per cent of the pain was relieved and the patient tolerated gradual decrease of narcotic analgesics; § *partial relief* was recorded if 25 to 75 per cent of the pain was relieved; *slight or no relief* was recorded if over 25 per cent of the pain was present at the time of discharge. In most patients, relief, when present, lasted until death.

Pain in the Head and Neck

The face, mouth, and throat are frequent sites of neoplasms which not infrequently produce severe pain by expansion and pressure on one or more of the cranial nerves. Extensive lesions may also involve the cervical plexus. The face is involved by tumors which commonly arise from structures about the mouth, nose and paranasal sinuses. Fortunately, these usually spare the eye and, therefore, the pain may be controlled by injecting the second and third divisions of the trigeminal

TABLE 2

RELIEF OF PAIN IN THE FACE, HEAD AND NECK
GRANT'S STATISTICS (10)

	Alcohol Injections				Operations			
	Complete Relief, per cent	Partial Relief, per cent	No Relief, per cent	Death, per cent	Complete Relief, per cent	Partial Relief, per cent	No Relief, per cent	Death, per cent
1st series	70	16	14	0	60	10	10	20
2nd series	65	17	18	0	77	7	6	11

nerve. However, if for any reason analgesia cannot be produced by injecting the second or third division, or both, the anesthesiologist should not hesitate to inject the gasserian ganglion, because the patient must obtain relief of pain, even at the price of keratitis. The problem here is quite different from that when dealing with patients who have *tic douloureux* in whom the life expectancy is long and a corneal ulcer is a serious complication. Gasserian ganglion block is also indicated in case the tumor displaces the second division so that it is impossible to inject it. The best results are obtained in these instances when the pain is within the sensory field of the maxillary nerve, because gasserian ganglion block produces a wide area of analgesia about the tumor, into which cancer can spread without producing more pain.

The pain consequent to carcinoma of the tongue may be controlled with lingual or mandibular nerve block, but if the malignant disease involves the base of the tongue, tonsils and throat, the glossopharyngeal

§ It should be stressed that it is unwise suddenly to withdraw all narcotic analgesics in patients who have cancer pain.

nerve must be also injected. In some cases the floor of the mouth and the neck are also involved, requiring, in addition to the above, paravertebral injection of the second and third cervical nerves. If the tumor involves the lower pharynx and larynx, superior laryngeal nerve block must be effected to relieve the pain.

Pain involving the middle and external ear is difficult to control, since this structure is supplied by many nerves—the fifth, seventh, ninth and tenth cranial and upper two cervical spinal nerves.

Frequently the tumor causes sympathetic pain with its characteristic qualities. Such pain is usually diffusely located over one side of the head, the eye, teeth of the lower (and sometimes upper) jaw, the temporal region and the nape of the neck. This pain may occur alone or it may accompany the typical neuralgia produced by the tumor. Whenever it is present, block of the stellate ganglion or the middle or

TABLE 3

PAIN IN THE FACE, HEAD AND NECK

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technique	No.	Complete	Partial	Slight or None	
Scalp and calvarium	3	Supraorbital, temporal and occipital	4	2	1	0	
Face	5	Trigeminal or its branches	5	4	1	0	Corneal ulcer in 1
Orbit	3	2 Gasserian and stellate	3	1	1	0	Corneal ulcer in 1
		1 Orbital	2	0	1	0	
Maxillary antrum and upper jaw	7	2 Maxillary	2	2	0	0	
		3 Gasserian	4	2	1	0	Corneal ulcer in 2
		2 Maxillary-gasserian and stellate	5	1	1	0	
Lower jaw	14	3 Infra-orbital, dental and lingual	5	2	1	0	
		5 Mandibular	6	4	0	1	Unilateral masticatory weakness
		2 Mandibular and maxillary	4	1	1	0	
		1 Mandibular and glossopharyngeal	1	0	1	0	
		3 Mandibular and C2 and C3	4	1	1	1	
Lips	5	1 Infra-orbital and maxillary	1	1	0	0	
		2 Mandibular and inferior alveolar	2	1	1	0	Unilateral masticatory weakness
		2 Infra-orbital, mandibular and upper cervical	3	1	1	0	Unilateral masticatory weakness

TABLE 3—*Continued*

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technique	No.	Complete	Partial	Slight or None	
Tongue	10	2 Lingual	3	1	1	0	
		1 Lingual and inferior alveolar	1	1	0	0	
		2 Mandibular	2	2	0	0	Unilateral masticatory weakness
		2 Mandibular and maxillary	4	1	1	0	Unilateral masticatory weakness
		3 Mandibular and glossopharyngeal	4	2	1	0	Unilateral masticatory weakness
Palate	1	Bilateral spleno-palatine	1	1	0	0	
Throat	14	7 Glossopharyngeal	9	5	1	1	
		3 Glossopharyngeal and lingual	5	2	1	0	Dysphagia on side of block
		1 Glossopharyngeal and maxillary	1	0	1	0	
		3 Glossopharyngeal and C2 and C3	3	1	2	0	
Pain deep in the ear	1	Trigeminal, glosso-pharyngeal and vagus	2	0	0	1	
Larynx	3	Superior laryngeal	4	3	0	0	
Neck	4	2 Paravertebral	2	1	1	0	
		2 Subarachnoid alcohol	5	1	1	0	
Total	70		97	44	22	4	36† 4‡
Per Cent	100			62.9	31.4	5.7	51† 5.7‡

† Not serious.
‡ Serious.

superior cervical ganglion is indicated. This should be done several times with local anesthetic agents because not infrequently temporary blocks are followed by prolonged relief. In the event repeated blocks do not produce prolonged relief, the block should be done with phenol or alcohol. The efficacy of nerve blocks as compared with surgical section in the management of cancer pain is obvious from two of Grant's series of cases (10) (table 2).

In our clinic nerve blocks have been employed in 70 patients with pain in the head and neck, as shown in table 3. In 4 of these patients corneal ulcers developed several weeks following gasserian ganglion block with alcohol. In one of these, tarsorrhapy was necessary to heal

the ulcers. Transitory unilateral masticatory weakness developed in 22 patients following mandibular nerve block.

Illustrative Cases

Case 1. A 78 year old white man, in 1946 noticed a small lesion of the lower lip which was treated for two years by a "naturopath" by means of a "cancer" salve. The lesion became progressively worse, and in 1948 he went to a physician

FIG. 3. Patient with extensive carcinoma of the lips and face which was accompanied by intractable pain. Alcohol block of the left maxillary and mandibular nerves and right inferior alveolar nerves produced relief until his death five months later. (Bonica, Management of Pain, Philadelphia, Lea & Febiger, 1953.)‖

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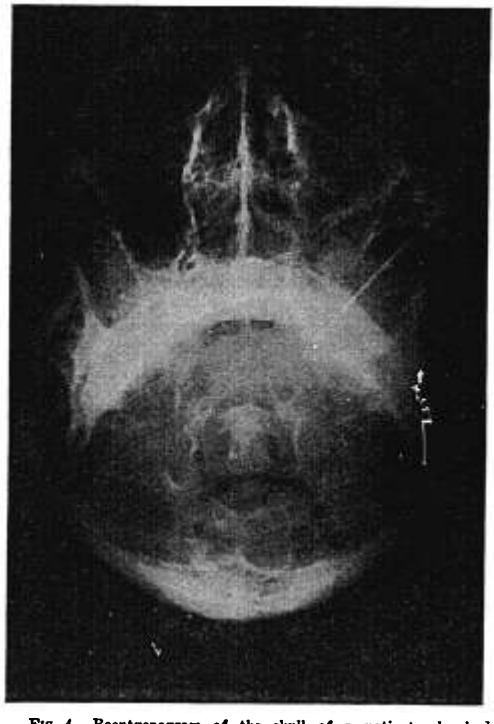

FIG. 4. Roentgenogram of the skull of a patient who had cancer of the superior alveolus which invaded the left maxillary antrum and left orbital cavity. Relief was produced with left gasserian ganglion block. Note clouding of the left maxillary sinus and also point of the needle in the foramen ovale.

for treatment. By this time the lesion was ulcerating and involved the lower lip and both cheeks (fig. 3). The patient had pain of a severe degree. This was completely relieved by left maxillary and mandibular and right inferior areolar nerve blocks without any complications. Following relief, the patient was treated with x-ray therapy, which effected some improvement of the lesion. He died five months later, still completely free of pain.

Case 2. A 67 year old man was referred to the pain clinic because of severe, intractable pain and hyperalgesia in the maxillary region caused by squamous cell carcinoma of the gum that had invaded the maxillary antrum. Large doses of morphine and intensive radiation therapy had been ineffective. On January 8,

1951, a maxillary block by the lateral route with pontocaine-alcohol produced partial relief of pain. Five days later he still felt pain in the orbital and supra-orbital regions. On January 15, a left gasserian ganglion block (fig. 4), with alcohol produced almost complete relief which lasted until his death five months later. During this time a corneal ulcer developed which necessitated a tarsorrhaphy.

Case 3. A 59 year old man had several recurrences of cancer of the lip which were treated conservatively. Eventually the lesion extended to involve the entire lower lip and left mandible, for which a very wide resection of the entire lower side of the face, including the mandible, pterygoid plate and soft tissues adjacent to them, was done and intensive radiation therapy given subsequently. A year later he had recurrence of the lesion, accompanied by severe pain that could not be managed with narcotics. When seen by the author on March 3, 1951, the patient had a conelike defect with its apex extending as far as the body

FIG. 5. Patient with extensive carcinoma of the left side of the face. The severe pain was relieved by blocking the left gasserian ganglion and the second cervical nerve. Note needle in place and left mandible missing.

of the sphenoid bone (fig. 5). It was obvious that maxillary, mandibular or gasserian ganglion block by the usual route was impossible because of the lesion. It was decided, therefore, to attempt a gasserian ganglion block by the orbital route whereby the needle was advanced into the middle cranial fossa through the foramen rotundum (fig. 5). With the aid of roentgenographic guidance, this was accomplished and the gasserian ganglion injected with 1 cc. of alcohol. In addition, the second cervical nerve was blocked. The resulting relief of pain lasted until he died five weeks later.

Case 4. A 54 year old white man had a tuberculous scrofula twenty years before admission which was treated by x-ray radiation with good results. This recurred, however, and was again treated with x-ray. Following this he sustained a burn of the neck with ulceration of the skin. This ulceration was treated conservatively for some time before a diagnosis of cancer was made. A wide surgical resection was attempted, but it was found that the lesion extended deep and was not resectable. The lesion was accompanied by a moderate amount of

pain. Subarachnoid alcohol block with 0.2 cc. of alcohol injected through each of three needles placed in the third, fourth and fifth interspaces (fig. 6) afforded complete relief of neck pain but did not relieve pain in the arm. This was completely relieved by a subsequent block with needles placed in the third, fifth and seventh cervical interspaces. The only complication was slight paresis of extremity.

Pain in the Upper Extremity

Cancer frequently produces pain in the upper extremities, which in the advanced stages is a continuous, severe, relentless discomfort that prevents the patient from moving the limbs. This pain may be

FIG. 6. Patient with carcinoma of the neck which was accompanied by severe intractable pain, relieved by subarachnoid alcohol block. Note severe ulceration of the neck and exposed carotid artery.

caused by (1) metastatic or primary tumors of one or more of the lower cervical and upper thoracic vertebrae with consequent pressure on nerve elements, (2) pressure on the brachial plexus in the supraclavicular fossa (producing so-called Pancoast syndrome) or axilla, (3) invasion of the nerve elements and large vessels by tumor cells producing a perineural and perivascular lymphangitis, and (4) pressure on one or more of the peripheral nerves or other pain sensitive structures by neoplastic lesions of the bones and soft tissues of the limb, such as osteosarcoma.

Pain caused by lesions of the first two categories may be controlled by subarachnoid or paravertebral nerve blocks. Since these pro-

cedures, like rhizotomy and peripheral nerve section, result in deafferentation and occasionally weakness of the extremity, they are not satisfactory because they produce an essentially useless limb. Nonetheless, if the pain is so severe as to prevent movement, relief is necessary. Subarachnoid block has the advantages of producing chemical section proximal to the site of the lesion and not being accompanied by chemical neuritis, which sometimes follows paravertebral block with alcohol. Brachial plexus block may be employed if the aforementioned

TABLE 4

PAIN IN THE UPPER EXTREMITY

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technic	No.	Complete	Partial	Slight or None	
Vertebral lesions	4	3 Subarachnoid alcohol	8	2	2	0	Weakness in 3
Pressure in brachial plexus	10	2 Subarachnoid alcohol	4	1	1	0	Weakness in 1
		3 Paravertebral	4	2	0	1	Paralysis in 3
		2 Brachial plexus	2	1	1	0	Paralysis in 2
		3 Combination plus stellate	4	1	1	1	Paralysis in 2
Vascular obstruction	4	2 Subarachnoid alcohol plus stellate	5	1	1	0	Weakness in 1
		1 Paravertebral plus stellate	2	0	1	0	Paralysis in 1
		1 Brachial*	2	0	1	0	
Peripheral nerve involvement	2	Median	2	1	1	0	Weakness in 1
Total	20		33	9	9	2	7† 7‡
Per Cent	100			45	45	10	35† 35‡

* With 6 per cent ammonium sulfate.
† Not serious.
‡ Serious.

techniques cannot be used or are ineffective, but since this procedure is attended by partial or complete motor paralysis, it should be used as a last resort. The diffuse, poorly localized sympathetic pain attributable to lesions of the third category is very difficult to control, but may be amenable to sympathetic blocks alone or in combination with subarachnoid or paravertebral injections. Pain resulting from lesions in the extremity are treated by peripheral nerve block so as to preserve as much function as possible.

Twenty patients with pain of the upper limbs have been treated in our clinic, as shown in table 4. The following are illustrative cases.

Illustrative Cases

Case 5. A 58 year old white woman had a radical mastectomy in 1948. In June 1951 she experienced sudden onset of pain in both shoulders and arms, more severe on the right. A roentgenogram revealed dissolution of the fifth cervical vertebra with compression of the fourth against the sixth (fig. 7). The pain was excruciating, necessitating large doses of opiates. Subarachnoid alcohol block was done with 0.3 cc. of alcohol injected into the third and sixth interspaces. This resulted in only partial relief of pain. The block was repeated

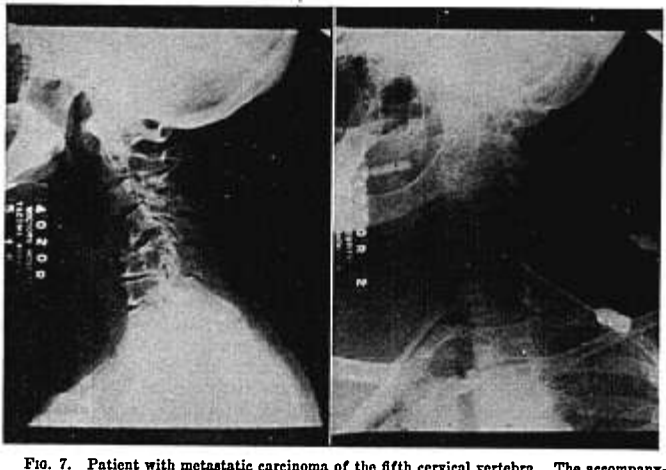

FIG. 7. Patient with metastatic carcinoma of the fifth cervical vertebra. The accompanying neuritis and neuralgia of the shoulder and upper extremity were relieved by subarachnoid block. (A) Lateral view showing collapse of the fifth cervical vertebra. (B) Posterolateral view showing needles in place.

twice before complete relief was effected. This lasted until her death eleven weeks later.

Case 6. A 47 year old white woman had a left radical mastectomy in June 1950. In April 1951 the left arm began to swell and the swelling progressed to a size two and a half times that of the right arm. This caused a severe, diffuse, burning type of pain. In August 1950 a series of stellate ganglion blocks was given to control the pain and reduce the edema, but these were unsuccessful and the pain became progressively worse. On August 21 a subarachnoid alcohol block was done with 0.5 cc. of alcohol injected through needles placed at the fourth and seventh cervical interspaces. This produced only partial relief of pain so that five days later a subarachnoid alcohol block was repeated

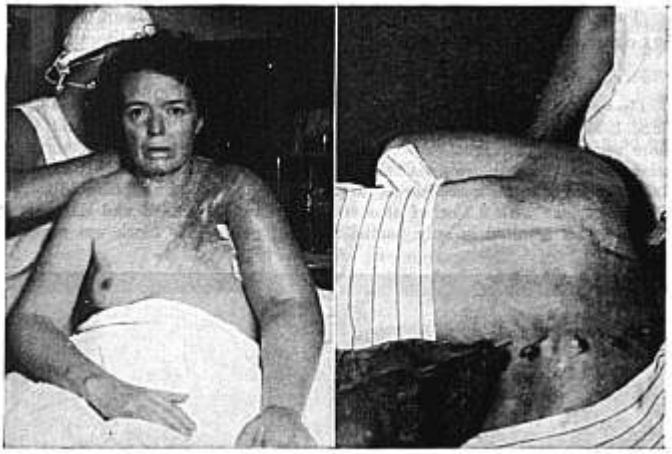

FIG. 8. Patient with severe edema of the left arm consequent to axillary invasion of breast carcinoma. Pain was partially relieved by subarachnoid alcohol block.

with 0.4 cc. injected through needles placed at the fifth, sixth, seventh and eighth cervical and second, third and fourth thoracic interspaces (fig. 8). This produced complete analgesia to pinprick of the entire extremity and subjectively relieved almost all of the pain. There remained some burning discomfort which was relieved with stellate ganglion block. On September 25 she began to complain of pain in the neck region and a paravertebral block was done with xylocaine and duracaine in the fourth, fifth and sixth cervical interspaces. On October 2 a more extensive subarachnoid block involving a wider area in the neck was done, which afforded about 50 per cent improvement of the neck pain.

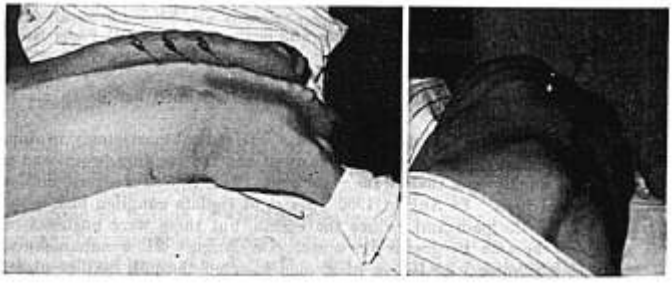

FIG. 9. Patient with metastatic carcinoma of the ribs and vertebral column. The associated pain was managed by subarachnoid alcohol block.

She was able to reduce the amount and number of doses of narcotics to about one-third. She died about two weeks following the last block.

Pain in the Trunk Caused by Cancer

Intractable pain in the trunk may be attributable to (1) tumors of the spinal cord and its meninges, (2) cancer of the vertebral column,

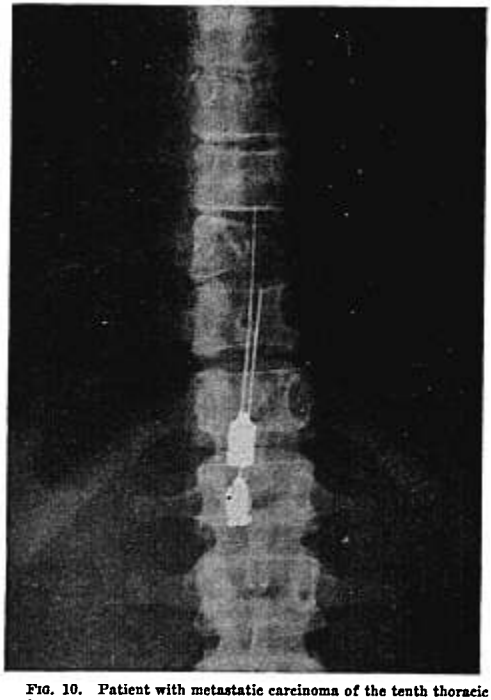

FIG. 10. Patient with metastatic carcinoma of the tenth thoracic vertebra with consequent compression. The girdlelike pain which accompanied it was relieved by subarachnoid alcohol block with needles placed in the ninth and tenth thoracic interspaces.

(3) cancer of the somatic structures including tumors of the ribs, sternum, pleura, peritoneum, mediastinum and the other soft tissues of the parieties, and (4) cancer of the thoracic and abdominal viscera. The first category is a neurosurgical problem and is mentioned here only to emphasize its importance as a cause of intractable pain of the

trunk and extremities. When the other lesions cannot be removed surgically, the pain must be managed by chemical or surgical interruption of pain pathways. The neuralgic pain caused by cancer of the vertebrae, paravertebral region and other somatic structures can be adequately controlled with subarachnoid alcohol block or paravertebral injections. The best results with subarachnoid alcohol block are obtained in pain of the trunk because, when properly executed, relief of pain can be obtained without danger of complications such as involvement of the extremities or bladder and rectal sphincters.

Illustrative Cases

Case 7. A 29 year old white woman had a radical mastectomy in June 1950 for carcinoma. About four months later metastases developed to the ribs and vertebral column. She complained of severe pain from the fifth to the ninth dermatomes bilaterally. This was relieved by subarachnoid alcohol block with 0.5 cc. injected through needles placed in the fifth, seventh and ninth thoracic

TABLE 5

PAIN IN THE TRUNK

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technic	No.	Complete	Partial	Slight or None	
Lesions of the vertebral column	9	8 Subarachnoid alcohol	13	6	2	0	
		1 Paravertebral	2	0	0	1	
Lesions of the ribs and other chest wall structures	15	9 Subarachnoid alcohol	13	6	2	1	
		2 Paravertebral	5	1	1	0	Neuritis in 1
		4 Intercostal	5	4	0	0	Neuritis in 1
Pressure on the spinal nerves by non-visceral, intrathoracic or abdominal tumors	10	6 Subarachnoid alcohol	11	4	2	0	
		3 Paravertebral	3	2	1	0	Neuritis in 2
		1 Peridural alcohol	2	1	0	0	Neuritis in 1
Lesions of the viscera							
Esophagus	2	Paravertebral sympathetic	3	1	1	0	
Lungs	11	3 Paravertebral, somatic and sympathetic	4	1	2	0	Neuritis in 1
		7 Subarachnoid alcohol	11	3	2	2	
		1 Peridural alcohol	1	0	0	1	
Stomach	4	1 Paravertebral sympathetic	1	0	1	0	
		2 Splanchnic	3	1	1	0	
		1 Subarachnoid alcohol	1	0	1	0	

TABLE 5—*Continued*

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technic	No.	Complete	Partial	Slight or None	
Liver	3	2 Paravertebral sympathetic	2	1	1	0	
		1 Splanchnic	1	1	0	0	
Gallbladder	6	1 Paravertebral and sympathetic	2	0	1	0	Neuritis in 1
		2 Splanchnic	2	1	1	0	
		1 Celiac plexus	1	0	0	1	
		2 Subarachnoid alcohol	3	1	1	0	
Pancreas	7	3 Splanchnic	4	2	1	0	
		1 Celiac ganglion	1	0	1	0	Orthostatic hypotension
		2 Subarachnoid alcohol	3	1	1	0	
		1 Peridural alcohol	1	1	0	0	
Kidney	2	1 Paravertebral	2	1	0	0	Neuritis in 1
		1 Peridural alcohol	2	1	0	0	
Total	69		102	40	23	6	4* 5†
Per Cent				58.0	33.3	8.7	6* 7†

* Not serious.
† Serious.

interspaces (fig. 9). The block was repeated three days later to relieve the other side. There were no complications.

Case 8. A 40 year old white woman had a radical mastectomy performed December 30, 1949. About five months later she started to have generalized metastases, and on August 18, 1950, experienced a severe, bilateral girdlelike pain extending around the side to the region of the umbilicus. The pain was excruciating, preventing her from moving and necessitating a general anesthetic in order to transfer her to the hospital. Roentgenograms revealed a compression of the tenth thoracic vertebra with narrowing of the interspace. A subarachnoid block was done at the ninth and tenth thoracic interspaces with 0.5 cc. of alcohol injected in each segment (fig. 10). This afforded complete relief of pain on both sides which lasted until her death. There were no complications.

Pain attributable to other lesions of somatic structures may be relieved with intercostal block. For extraspinal injection of somatic nerves 6 per cent ammonium sulfate may be tried before alcohol is resorted to because occasionally it produces relief of pain of sufficient degree and duration without producing chemical neuritis. Pain of visceral origin is best treated by paravertebral or prevertebral injec-

tion of sympathetic nerves. If a thoracic viscus is the source of pain, paravertebral block of the upper five or six sympathetic ganglions may be effective.

Case 9. A 58 year old man entered the hospital on March 30, 1951, for management of severe, intractable pain in the epigastrium, substernally, and in the back which was caused by a carcinoma of the esophagus that had invaded the trachea just above the carina. On April 2, 1951, block of the second, third, fourth and fifth thoracic sympathetic ganglions with 0.15 per cent pontocaine produced complete relief of pain. This was repeated the next day with xylocaine-alcohol. Relief lasted for four months.

For pain caused by cancer of the abdominal viscera, block of the splanchnic nerves or celiac plexus is done first with local anesthetics and then with alcohol.

Case 10. A 73 year old white woman had an exploratory laparotomy in January 1950. An inoperable carcinoma involving the pancreas, stomach and gallbladder was found. About a month later severe pain developed in the epigastrium. This was treated with a bilateral celiac ganglion block with alcohol, which afforded partial relief of pain until her death. Following the block orthostatic hypotension developed, probably as a result of the splanchnic block, which was controlled by oral administration of ephedrine.

Since most of the viscera have bilateral innervation the block should be done bilaterally. In the event these procedures are ineffective, subarachnoid alcohol block should prove efficacious, since all pain fibers, whether visceral or somatic, enter the spinal cord through the posterior roots.

Sixty-nine patients with pain of the trunk attributable to cancer have been treated in our clinic with nerve blocks, as shown in table 5.

Pain in the Pelvis, Lower Back, and Lower Extremity

Pain in the pelvis, lower back and lower extremities frequently accompanies metastatic or primary tumors of the lumbosacral spine, or advanced inoperable or recurrent malignant tumors of the pelvic viscera, which produce visceral pain and later lumbosacral neuralgia (sciatica) as a result of involvement of the lumbosacral plexus or the nerves forming it. In most of these cases the severe pain can be relieved by subarachnoid alcohol block. Unfortunately, the use of this procedure in the lumbosacral region is accompanied by deafferentation and occasionally by weakness or paralysis of the lower extremities and the bladder or rectal sphincters or both. The latter are serious complications which can and should be prevented by using proper technique and small volumes. When these occur they should be managed properly. It should be emphasized that this danger should not deter one from using the technique.

In some cases paravertebral or caudal block can be done first with

local anesthetic agents and then with 6 per cent ammonium sulfate. Some authors (21, 74) have reported good results with oil solutions, specifically proctocaine,® and others (38, 74) advocate caudal or paravertebral block with concentrations of alcohol ranging from 25 to 60 per

TABLE 6

PAIN IN THE PELVIS, LOWER BACK AND LOWER EXTREMITY

Site of Mechanism of Pain	No. of Patients	Block Procedure		Relief of Pain			Complications
		Technic	No.	Complete	Partial	Slight or None	
Lumbosacral spine or pelvis	13	10 Subarachnoid alcohol	16	3	4	3	Paresis of extremity in 3; sphincter involvement in 2
		2 Caudal-transsacral	3	1	1	0	Sphincter paralysis in 1
		1 Peridural alcohol	1	1	0	0	
Pelvic viscera							
Rectum and anus	5	1 Lumbar sympathetic	1	1	0	0	
		4 Subarachnoid alcohol	6	3	1	0	Weakness of extremity in 2; sphincter paralysis in 3
Urinary bladder	1	1 Lumbar sympathetic	2	0	0	1	
		Subarachnoid alcohol	2	1	0	0	Weakness of extremity and bladder dysfunction
Prostate	2	Subarachnoid alcohol	3	1	1	0	Bladder paralysis in 2
Uterus	8	2 Lumbar sympathetic	2	1	0	1	
		6 Subarachnoid alcohol	9	2	2	2	Weakness of extremity in 2; sphincter paralysis in 2
Lesions of the extremities	6	2 Peripheral	2	1	1	0	Paralysis of extremity in 2
		4 Subarachnoid alcohol	6	3	1	0	Paresis in 1; sphincter paralysis in 1
Total	35		53	17	11	7	8* 13†
Per Cent	100			48.7	31.3	20	22.8* 37.0†

* Not serious.
† Serious.

cent in order to avoid some of the complications. It should be remembered, however, that since the parasympathetic nerves which supply motor fibers to the pelvic viscera, including the sphincters, are thinly myelinated, they are susceptible to any concentration of drug which is capable of interrupting pain fibers.

Patients with visceral pain may be treated with lumbar sympathetic block done first with a local anesthetic agent and later with 6 per cent phenol.

Thirty-five patients with cancer pain of the pelvis, lower back, and lower limbs have been treated, as shown in table 6.

Illustrative Cases

Case 11. A 78 year old white woman had a radical mastectomy performed February 14, 1949. A year and a half later metastases developed involving the fifth lumbar vertebrae and right femur, with consequent severe pain across the lower back, gluteal region and right hip and leg. A subarachnoid block was done through a needle placed in the third lumbar interspace (fig. 11). This

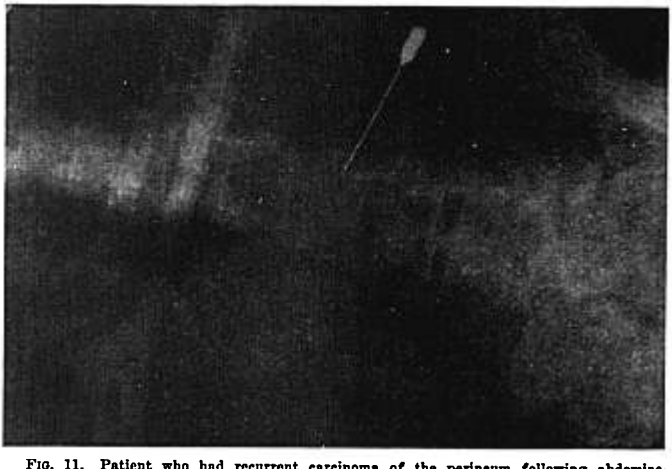

FIG. 11. Patient who had recurrent carcinoma of the perineum following abdominoperineal resection. The accompanying severe pain was relieved by subarachnoid alcohol block done by inserting a needle in the third lumbar interspace.

afforded partial relief of pain. The block was repeated six days later at the second lumbar interspace and was followed by complete relief of pain without any complications.

Case 12. A 73 year old man had an abdominoperineal resection for carcinoma of the lower bowel in September 1949. In April 1950, he began to complain of severe pain in the perineum, extending down the legs. Complete relief was afforded by means of subarachnoid alcohol block at the third lumbar interspace (fig. 12). Although this patient sustained bladder paralysis, he was completely free of pain until his death five months after the block.

COMPLICATIONS

The incidence of complications varies with the location of the pain and type of nerves involved. Block of mixed nerves is, of course, usually followed by motor weakness or paralysis depending on the solution employed. As previously mentioned, blocks to control pain in the upper or lower extremity not infrequently produce weakness or paralysis of the limb. Moreover, blocks in the lumbosacral region may involve the rectal and bladder sphincters.

Corneal ulcers developed in 4 patients several weeks after gasserian ganglion blocks with alcohol. In one of these, tarsorrhaphy was necessary to heal the ulcer.

FIG. 12. Patient with metastatic carcinoma involving the fifth lumbar vertebra and pelvic bones, accompanied by severe p. in in the low back and lower extremities. The pain was partially relieved by subarachnoid alcohol block.

Unilateral masticatory weakness developed in 22 patients following mandibular nerve block which lasted from three to eight weeks.

Paresis or paralysis of an extremity developed in 26 patients. It should be noted that this complication occurred in patients who had involvement of an extremity. Some of these patients had only partial function of the extremity before block therapy. Most of the patients regained some function after a period of time varying from five weeks to three months. All of them accepted the loss of function without remorse. One patient was able to use her left arm again when the pain was relieved.

Postinjection neuritis developed in 7 patients. In 3 of these the neuralgia was severe and required intravenous procaine therapy or narcotics or both for management. All of these cases occurred following paravertebral block.

Orthostatic hypotension occurred in one patient following bilateral celiac plexus block with alcohol.

Twelve patients sustained bladder or rectal dysfunction or both, which necessitated an indwelling catheter and other urological care for periods varying from nine days to seven months. In 2 cases the urinary incontinence persisted longer than six months. In one of these, the patient requested another block for returning pain at the end of five months.

SUMMARY

The pain associated with advanced inoperable or recurrent malignant lesions is a difficult clinical problem which should interest every physician. The anesthesiologist can make a significant contribution to the management of this problem by applying his knowledge, skill and dexterity in using regional analgesia. Analgesic block, when properly executed and effective, affords adequate relief without adding to the patient's discomfort.

For pain of the face, mouth, tongue, throat and neck, alcohol injections of the trigeminal nerve or its branches, the glossopharyngeal and vagus nerves, and/or the upper cervical spinal nerves are usually very effective. Pain below the neck can be controlled for weeks or months with subarachnoid alcohol block, paravertebral block or injections of peripheral or intercostal nerves. Since in many of these cases the sympathetic nervous system is involved in the pain mechanism, sym-

TABLE 7

SUMMARY

Region	No. of Patients	Relief						Complications				Death
		Complete		Partial		None		Not Serious		Serious		
		No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent	
Face, head and neck	70	44	62.9	22	31.4	4	5.7	22	30	4	5.7	0
Upper extremity	20	9	45	9	45	2	10	7	35	7	35	0
Trunk	69	40	58	23	33.3	6	8.7	4	6	5	7	0
Pelvis, lower back, lower extremity	35	17	48.7	11	31.3	7	20	8	22.8	13	37	0
Grand Total	194	110	56.7	65	33.5	19	9.8	41	21.1	29	14.9	0

pathetic nerve blocks occasionally are necessary to alleviate the pain completely.

Of a group of 194 patients with severe cancer pain treated with analgesic block, 52.7 per cent obtained complete relief, 33.5 per cent partial relief which was sufficient to be considered very worth while by the patient and physician, and the remainder obtained minimal or no relief.

Minor complications occurred in 21.1 per cent of the patients and serious complications in 14.9 per cent. These complications included corneal ulcers in 4, unilateral masticatory weakness in 22, weakness or paralysis of one or more extremities in 26, bladder or rectal dysfunction, or both, in 12, postinjection alcoholic neuritis in 7 and orthostatic hypotension in one.

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