THE ROLE OF STELLATE GANGLION BLOCK AFTER ANASTOMOSIS OF SEVERED BRACHIAL ARTERY: * † REPORT OF A CASE

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STELLATE ganglion block with any of the usual agents is ordinarily effective in interrupting the sympathetic impulses to the upper extremity as well as to the head and neck. To obtain paralysis of all sympathetic pathways to the upper extremity it is probably necessary to block the sympathetic ganglions from the first through the fifth thoracic on the affected side. That adequate temporary paralysis for most requirements can be fulfilled by the simpler and less time-consuming stellate ganglion block, however, is illustrated by the following case.

A 19-year-old colored man was admitted to the surgical service of L. K. Ferguson, M.D., at the Philadelphia General Hospital. Thirty minutes before his admission at 11:15 p.m. on November 27, 1948, he had been shot in the mid-portion of the left upper arm. He was transferred immediately to the operating room on arrival at the hospital.

Examination of the patient revealed that he was well-developed and not in shock. The left upper extremity was cold and clammy from the mid-portion of the upper arm distally. No arterial pulsations were palpable in the antecubital space or at the wrist. There was virtually no bleeding from the wound at this time, and the patient stated that he had bled very little. The lower arm and hand were numb.

A left stellate ganglion block was done with 12 cc. of 1 per cent procaine by the anterior approach to determine the role of vasospasm in obliteration of the arterial pulsations. A left Horner's syndrome was obtained, and the left arm proximal to the injury became much warmer to palpation. There was no return, however, of the peripheral pulse and no change in the temperature of the distal portion of the injured arm. It was decided that the brachial artery was either severed or compressed by a large hematoma. Immediate operation was deemed advisable and was instituted one and one-half hours after the injury.

General anesthesia was induced with nitrous-oxide and oxygen combined with 0.1 per cent sodium pentothal by drip infusion. Ex-

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ploration revealed that the left brachial artery was completely severed by the bullet which had traveled on into the axilla. An end to end anastomosis of the severed artery was done. No attempt was made to remove the bullet for fear of disturbing the anastomosis. When the bulldog clamps were removed from the artery on completion of the anastomosis, no peripheral pulses could be felt, and that section of the artery which had been clamped was seen to be in severe spasm. The vessel was bathed in 1 per cent procaine but the spasm was not relieved. Peri-arterial sympathectomy by stripping the adventitia from the exposed portion of the artery was equally unavailing. Procaine, 10 cc. of a 1 per cent solution, was then injected by the anterior approach into the region of the stellate ganglion. Within three minutes the ischemic band in the artery disappeared and the vessel assumed a uniform diameter throughout its exposed length. A definite radial pulsation appeared. The wound was then closed, by which time the entire left arm and hand had become warm and dry.

TABLE 1

EFFECT OF LEFT STELLATE GANGLION BLOCK ON SKIN TEMPERATURE OF THE FINGERS MEASURED IN DEGREES FAHRENHEIT

Finger		Left		Right	
		Before	After	Before	After
1		82	94	84	78
2		78	94	81.5	75
3		75	95	80	74
4		74	95	79	74
5		74	94	79	73
	Room temp.	76	77	76	77

Immediately after operation papaverine, 1½ grains every four hours, was started and was continued until December 4, 1948 (eight days). Heparin was administered immediately after operation and continued through November 30, 1948. Dicumarol was begun on the first postoperative day and continued through December 4, 1948. Thus, anticoagulant therapy was maintained for a period of eight days. Additional treatment consisted of one prophylactic dose of tetanus antitoxin, 1500 units intramuscularly, and penicillin, 50,000 units every three hours by the intramuscular route.

During the next thirteen hours three stellate ganglion blocks were done on the affected side, using 15 cc. of 1 per cent procaine for each block. The pulse at the wrist never completely disappeared after the operation, but it had much greater force following each stellate block. With succeeding blocks the duration of sustained adequate pulsations was prolonged. The hand and arm remained warm and dry at all times after operation. Within twenty-four hours the patient had good motion in the hand.

For the next five days the left stellate ganglion was blocked daily. Progress was continuous and sensation was normal except for a feeling of numbness and tingling in the distribution of the ulnar nerve. This was attributed to the prolonged traction on the nerve trunk during the operation.

The patient was discharged on the thirteenth postoperative day. After discharge he was seen frequently in the clinic. Stellate ganglion blocks were done once weekly for the first six weeks following discharge from the hospital. Atrophy of the muscles of the hand disappeared rapidly with physiotherapy and the patient's active use of the arm and hand at his work. On December 20, 1948, skin temperature readings were taken on the hands before and after left stellate block. The results are given in table 1. From the marked increase in temperature on the blocked side, it is evident that stellate ganglion block was effective in interrupting sympathetic vasoconstrictor impulses to the upper extremity in this patient.

Elective removal of the bullet was done on January 27, 1949, under local anesthesia. The bullet at this time was in the subcutaneous tissues of the posterior axillary fold. He was discharged on the following day.

At the present time, four and one-half months following the injury, the patient states that there is no appreciable difference in the exercise tolerance between his two hands. He has never had any claudication and has been working as a shipping clerk in an unheated warehouse since the initial discharge from the hospital. The left hand feels cooler to touch than the right but an adequate radial pulse is present.

The case is presented to illustrate the role that block of the sympathetic nerve supply can play in effective treatment of vascular injuries requiring surgical procedures on blood vessels, particularly arteries.

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