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Vulnus cordis. Heart suture
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That wounds of the heart should become the object of surgical intervention to stop hemorrhage is rare, because as a rule the patient either quickly bleeds to death, or the wound is so insignificant or located in such a place that bleeding stops spontaneously. In surgical department A at the Rigshospital, we had a case where because of a stab wound in the heart, suturing of the heart was undertaken. The case had a lethal outcome two and a half days after the operation, partly as the result of profuse bleeding, partly as the result of pericarditis. However, it appears that it is possible both to place sutures on the heart itself and thereby to stop bleeding from it. The wound was not perforating in this case, however, and bleeding came essentially from one of the large branches of Art. coronaria.

The case history is as follows;

K. L., age 24, was admitted to the department on 4 September at 1:21 a.m. It was explained that earlier in the evening he had received a knife stab in the left side of the chest. He went home alone and had been found about one hour before his admission, lying on the floor in a pool of blood. He was conscious at the time, and supposedly had been lying on the floor for at least one hour. He was taken to the hospital in an ordinary taxi.

Status praesens: Patient unconscious, lying with half-open eyes, pale as a corpse, in a cold sweat, lips bluish. Now and then there was stertorous respiration. Pulse impalpable. There was a weak, distant clean heart sound at the right sternal edge, at the level of the fourth rib. Diastole not palpable. In the fourth intercostal space in the mid-axillary line on the left side, a non-gaping stab wound 1 centimeter in length, parallel with the rib. No bleeding from the wound.

After several camphor injections he began to breathe. The pulse was palpable, and consciousness returned little by little. He had a few attacks of coughing, without sputum. Greening respiration, 44. Left half of the chest did not move in respiration. Neither respiration nor heart sound on the left side. Over the sternum and a finger-breadth to the right of it, from the fourth to the sixth rib, weak damped percussion sound. Here a clean muffled heart sound was heard. Dull-damped percussion sound from the rearmost axillary line to the mammilar line all the way to the top, with sonorous percussion sound nearer the sternum. No bleeding from the wound, and no air entered or left in the course of respiration.

The wound was bandaged and the patient was laid in bed, head low. An hour later there was some bleeding from the wound after vomiting. Since he was now extremely anemic with pulse barely palpable, resection of the fourth and third ribs and heart suture was undertaken, with chloroform narcosis.

The wound was widened: no lesion found on the intercostal artery. Subperiosteal resection of the fourth rib, length 6 centimeters. Bloody parts on the pleura split perpendicularly in the direction of the rib. Pleural cavity found to be filled, partly with coagulated blood, partly with fluid light blood. The lung

was compressed. About one liter of blood was collected, and what flowed out was estimated to be about 400 cc. The lung now expanded: no lesion was found anywhere but bleeding continued and seemed to be coming in from the left. By introducing a finger in toward the heart, a hole was found in the pleura, large enough pericardially to receive the fingertip. In order to get room, subperiosteal resection of 5 cm of the third rib and supporting piece of the rib cartilage. Bloody parts split as before. The cut in the pericardium could now be seen. It was one centimeter long, and there was heavy bleeding from the opening. With a couple of artery pincettes, the edges of the pericardium were grasped and lifted off. The pericardial sheath was filled, partly with coagulated blood, partly with fluid blood. The opening was widened, and now in the left ventricle a 2 cm long wound could be seen, from which the bleeding came. Depth of the wound was not investigated. It was sutured with continuous sutures of chromicized catgut, and because bleeding continued from a large artery, this was given a few sutures, after which the bleeding stopped. The suturing was rather difficult, because with each contraction the heart made a jumping movement forward toward the wound opening, and during the diastole it fell all the way back again, while at the same time the lung filled the operation cavity at each inspiration. The sutures were placed with a strongly curved needle that was taken half way through during a contraction of the heart, whereupon it was entirely let go, and when the heart fell back again after the next contraction the tip was grasped and the needle pulled through. Cardiac contractions during the whole suturing time were regular and quiet. The pericardial [illegible] was cleansed of blood, but a clot had to be left, which lay upward and toward the back: it was not possible to remove it without turning the whole heart rather pronouncedly upward. The pericardium was sutured whole, as well as the pleura, periosteum, intercostal muscles and the skin after the pleural cavity had been cleansed of blood insofar as this was possible. The pleural cavity was drained with sterile gauze. Apparently the patient had no trauma from the chloroform. Narcosis was quiet, as in an ordinary operation. After the operation the pulse was very rapid and small. After a subcutaneous salt water injection, 600 cc, this was significantly corrected. The patient was laid in bed with lowered head, legs elevated and extremities wrapped.

5 September. Slept a little in the night. Weak, but said he felt well. Rather pronouncedly anemic. Heart sounds clean. Temperature 35.5°. Pulse regular, 120. Superficial respiration, 40. Bandage oozing thin blood-colored fluid. Change.

6 September. Restless again. Slept one half to one hour at a time after morphine injection. No complaining. Weak systolic blowing over the whole heart. Temperature 37.2-36°. Pulse 128, small. Digitalis

7 September. Restless in the course of previous day. Toward evening more and more cyanosed. Sterterous respiration frequent. Temperature 37-38.6°. Pulse 132, small, soft. Died the same morning at 9 a.m.

Section undertaken the next day. In the pericardial cavity there was a lot of partly coagulated slightly brownish blood and fibrin, partly muddy chocolate colored fluid. Both leaves of the pericardium were partly stuck together by the intermediate coagulated masses, and the heart's outer surface was coated with a thick fibrous exudate. Down toward the tip of the heart and about one centimeter to the left of the sulcus longitudinalis there was a 2 cm long wound, sutured together. By loosening the threads, the wound surfaces were shown to be somewhat agglutinated, and the wound was found to go in to about the middle of the wall thickness. No blood in the wound. A large branch from the Art. coronaria was cut. The coagulated blood removed from the pericardial cavity weighed 45 grams. Heart

musculature somewhat pale, grey-reddish. Nothing to note concerning the valves. In cover glass preparations from the coating on the pericardium, many cocci were seen, partly as diplococci, partly disposed in short chains. A few gram-staining rods were also seen.

Some modern surgical textbooks, e.g. Hiltner-Lossen, 1892, recommend surgical intervention in heart lesions where the bleeding does not stop spontaneously. I have not found the report of any case in which it was done successfully, however.

The present case was unlucky insofar as it was not possible immediately to say, with certainty that the heart itself had a lesion. The knife passed from the stab opening in the left axillar line through the pleura, past the lung without damaging it, then through the pleura and pericardium and into the heart. Where the stab opening or lesions are directly above the heart, there would of course be a faster decision to operate if necessary, and the whole lesion would in such a situation be less complicated, and the operation easier to execute.

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