REMOVAL OF A NEEDLE FROM THE HEART.

RECOVERY OF THE PATIENT.

BY

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THE following case is, I believe, the only instance on record in which a patient has recovered after the removal by a surgical operation of a needle from the heart.

J. E—, æt. 31, a pewterer, during a struggle in a public house missed a needle which he had placed in the left side of his coat, and he fancied that it must have entered his chest. The day after, feeling some pain in the left side, he came to St. Bartholomew's for advice. No wound was to be seen, either then or later, and as nothing could be felt on examining the chest no treatment was at this time indicated. For nine days he followed his ordinary occupation, but all these days he was in pain, until at length the discomfort became so great that he again applied for relief.

On October the 28th, 1872, he was brought under my notice in the consultation room. He was a pale, but fairly well-nourished man, in good general health and with a good family history. He told me he had been troubled since the

occurrence of the presumed accident with what he called "beating" of the heart, and had pain, which he very consistently described as continuous, extending from the left nipple towards the corresponding armpit, and thence down the inner side of the arm to the elbow, apparently along the course and in the distribution of the lesser internal cutaneous nerve.

There was no mark of an entrance wound to be found on the chest, but my house surgeon, Mr. Brewer, drew my attention to a very slight fulness in the fifth intercostal space, about the existence, however, of which some who examined the chest were uncertain, so slight was it. On passing my finger very lightly over this spot, I thought that a slight elevation could be felt, and although great doubt was expressed on this point yet in consideration of the man's story, and knowing that the incision through the integument could do no harm, I decided to explore and so settle the question.

Having selected a spot at which it felt as though with each impulse of the heart something firmer than the surrounding tissue was pushed against my finger, moving with the impulse, and if a foreign body, fixed it seemed to me, in the heart, I found that the point thus chosen was one inch and two tenths below the left nipple, three tenths of an inch to the mesial side of a line perpendicular to the nipple, and three inches and five tenths from the middle line of the sternum (Fig. 1). It corresponded with the fifth intercostal space.

The heart's sounds were natural and the impulse was not increased.

Chloroform having been given to the patient, who had been moved into the operating theatre, the skin and subcutaneous structures were divided, the latter being deeply laden with fat, and then the end, the broken eye as it proved, of the needle, was distinctly felt. Clearing away the cellular tissue which lay immediately over the foreign body, its extremity, on a level with the surface of the intercostal muscle, was brought into view. It moved with each

FIG. 1.

impulse of the heart, describing a curve forwards, and at the same time a second curve to the right, the latter being evidently caused by the moving of the opposite end of the needle to the left with the action of the heart. The space traversed by the exposed end of the needle, vertically, horizontally and forwards, was in each direction by measurements (with callipers) just under one tenth of an inch.

After measuring the range of motion I held with ordinary forceps and drew out from the chest (in a vertical line as the patient lay on the operating table) a needle entire, with the exception of the extremity of the eye, and one inch and nine tenths in length. The heart's action was not affected during or by the withdrawal of the needle, but some blood welled up from the puncture, and continued to ooze until the wound was closed by sutures, and covered with a compress of lint soaked in carbolised oil.

The accompanying diagram shows the length of needle in the wall and also in the cavity of the chest. It gives the extent of movement at the eye and, allowing for the thickness of the intercostal wall and for the length of the foreign body, it indicates the range of movement within the chest (Fig. 2). The measurements figured in the diagram

FIG. 2.—Length of needle.

o Minimum range of vertical and horizontal displacements.

are based on the supposition that the needle worked on a centre corresponding with the inner surface of the wall of the thorax, and therefore give the minimum range of vertical and of horizontal displacements.

From the time of his recovering from the effects of chloroform the patient was entirely free from pain, and, with the exception of certain variations in the frequency of his pulse, convalesced without any marked symptoms. I considered it prudent to keep him in bed until time had been given for the repairs of the structures which had been punctured and he was not allowed to get up until four weeks had elapsed. On the fourth of December he was up for the first time but almost immediately experienced a severe pain which he described as being deeply seated under the left nipple and being alarmed he again lay down. After a few days he was able to be up and about, and on the 20th of December was discharged to the Convalescent Hospital.

The day after the operation Dr. Lauder Brunton had the kindness to take a sphygmographic tracing of the radial pulse, of which the accompanying is a copy (Fig. 3).

FIG. 3.

Tracing of radial pulse. Oct. 29th, 1872.

The notes of the patient's pulse, temperature, and respiration after the operation are given in the following table.

Day after operation.	Pulse.	Temp.	Resp.
Evening	72	98·2	18
1st day.—Morning	92	99·5	25
" Evening	64	98	27
2nd day.—Morning	76	98·2	22
3rd day " 	76	98·2	22
4th day " 	76	98·2	22
5th day " 	88	98·8	18
" Evening	64	97·2	14
6th day.—Morning	64	97·2	16
7th day " 	64	97·2	16
12th day " 	70	98·5	16
13th day " 	62	...	...
14th day " 	70	...	...
15th day " 	56	...	...
16th day " 	68	...	...
17th day " 	58	...	...
18th day " 	68	...	...
21st day " 	68	...	...

There are only a few words I would add to the history of this case.

(a) The pain of which complaint was made was due one must suppose to irritation of an intercostal nerve. It was referred so accurately to the course of the intercosto-humoral and to the lesser internal cutaneous, that no other explanation of it can be entertained.

(b). The two scars which are seen on the patient's chest are due to my first mark having been moved from its relation to the intercostal space by the raising of the patient's arm by an assistant just before the operation was commenced, a movement which escaped my notice at the moment, but which rendered it subsequently convenient to make the second and lower cut.

(c). The needle must have passed through the heart close to the apex. The movements communicated to it were too regular and agreed too well with those of the impulse to have been caused by anything but the action of the heart upon the needle which transfixed it.

(*d*). Two cases have been recorded in which it is said that the removal of a needle from the heart has been followed by recovery. The reports, of these cases are, however, unsatisfactory. Of the first (Case 10 in the appended table) it is said that the patient had all the symptoms of acute inflammation of the heart and of the pericardium, yet these symptoms disappeared the instant that the foreign body was removed. This is, at least, a very improbable story. All that is told us respecting the position of the needle is, that it was found "in a line with the external intercostal muscle." In the other case (No. 12 in the table), there is no evidence that the needle had wounded the cardiac walls or the pericardium. It had entered in the sixth intercostal space and was therefore, in all probability, below the situation of the heart.

(*e*). It is unfortunate that Dr. Fischer's table of cases of foreign bodies in the heart and Pericardium has been translated and published in the 'System of Surgery' without its having been verified. In taking from it the cases from which it may be inferred that certain patients have survived for some time the introduction of a needle, or some similar body, into the heart (the foreign body being extracted by a surgeon or remaining within the chest), I find, on looking to the original reports of the cases, so much that is doubtful and such inaccuracies in transferring them as alter very much the complexion of the table. I append a list of these cases, giving with it the numbers which refer to Dr. Fischer's table, and by comparison the important differences in the two will be manifest.

(*f*). The material point is this—that so far as these bodies, needles and the like, are concerned, there are only three cases on record (Nos. 1, 11, 13, in table), the original reports of which are the only ones I have been unable to refer to, in which it is possible that life has been preserved for more than a few weeks after the entrance of the foreign body into the textures or cavities of the heart. In all the remaining cases of supposed retention of life there is no evidence as to the time at which the heart was injured.

There is simply presumptive evidence that it was reached, if at all, through the œsophagus or stomach.

(g) These remarks apply only to cases in which needles or similar bodies have been found in the heart, to which class of cases alone my present observations refer.

Cases in which needles or similar foreign bodies have been removed from or found after death in the heart and pericardium, and from which it has been inferred that life may be retained for a long time after the occurrence of the injury. Evidence doubtful in most cases.

No.	No. in Fischer's table.	Foreign body.	External entrance.	Situation in heart or chest wall.	Duration of life.	Reference.	Remarks.
1	2	Needle	Sternum	Entirely in the wall of right ventricle	6 years	Gerard, Essai sur la Lethalite des Plaies Penet. du Cœur. These, Strasbourg, 1858, Obs. 7	Quoted by Fischer.
2	4	Needle	No evidence	Entirely in the wall of left ventricle	No evidence	Niel, New York Jour. of Medicine, July, 1849	Subject brought in for dissection. No opening in heart by which it could have entered at the time of injecting the subject for the rooms. Condition of adjacent parts not well made out. Subsequently ascertained that he had worked for twelve months since entering hospital in 1847. No evidence as to time of entrance of needle.
3	10	Needle	Œsophagus	In the wall and cavity of both ventricles	22 days after beginning of heart symptoms	Leaning, Philadelphia Medical Examiner; Lond. Med. Gazette, Jan., 1844	Dr. Leaning says that this needle in nine months traversed the pleura, lung, diaphragm, œsophagus, and finally entered the heart. It was originally introduced one inch below and on sternal side of left nipple.

4	12	Needle	Esophagus?	In the wall and cavity of right auricle near vena cava	No evidence	Sklersky, Ami de la Santé, 1841; Jamin, des Plaies du Cœur, p. 45; Legrand de Saille, Gazette des Hôpitaux, 1858	A woman, over 50, had suffered from pain in the chest for a long time. She died suddenly at the time at which an aneurism burst into the pericardium.
5	13	Pin	No evidence	In the wall and cavity of left ventricle	No evidence	Darian, Report by Legrand de Saille, Gazette des Hôpitaux, 1858	Patient died from erysipelas. No history or symptoms relating to the pin which was found at the post-mortem examination.
6	20	Thorn	Esophagus	In the cavity of right ventricle	1½ year	Kussmaul, Würzburg Med. Zeitschr., 1864	Quoted by Fischer. No evidence as to time at which heart cavity was reached.
7	22	Needle	No evidence	In the cavity of left ventricle	No evidence	M. Pierre for Laugier, Bulletin de la Société Anatomique, p. 334, 1848-49	No history as to mode of entrance. No symptoms. Embolism of arteries and gangrene of leg.
—	23	—	—	—	—	—	Quoted by Fischer. The same case as No. 22.
8	29	Fish-bone	Stomach	Uncertain	No evidence	Med. Times, vol. i, p. 467, 1860	Newspaper report of coroner's inquest. Mr. Andrews found a fish-bone protruding through stomach into heart.
9	30	Needle	No evidence	Uncertain	No evidence	Hennen's Military Surgery, Edin., 1818, p. 429	The patient suffered from symptoms of carditis for three months.

No.	No. in Fischer's table	Foreign body	External entrance.	Situation in heart or chest wall.	Duration of life.	Reference.	Remarks.
10	40	Needle	5th inter-costal space	Uncertain	No evidence	Lynch O'Connor, Trinidad, Lond. Med. Gazette, Oct., 1835, p. 82	No evidence in report of wound of heart. Needle found "on a line with the external intercostal muscle." Symptoms: "Hurried respiration, and all the symptoms of acute inflammation of the heart or its membranes," which subsided the moment the needle was withdrawn. Patient recovered.
11	43	Iron pin	Thorax	In sternum, lesion of base of heart	12 years	Krügelstein, Henke's Zeitschr., 1843, 4, s. 295	Quoted by Fischer.
12	44	Needle	6th inter-costal space	Uncertain	No evidence	Trelat, Bulletin de Therapeut., 1845, tom. xxix, p. 558; also Legrand de Saillie, op. cit.	No symptoms. The patient, a lady, complaining that the surgeon had left a needle in her chest, induced him to try and remove it. No evidence that it had passed into heart or pericardium. Patient recovered.
13	—	Needle	No evidence	In left ventricle, point penetrating into left auricle through cusp of valve	No evidence	Biffi, Gaz. Med. Italiana Lombardia, Oct. 16, 1869; Med Times, vol. ii, 1869, p. 532	Death from gangrene of tongue. The only evidence was a statement by the friends that the patient had told them he had thrust a needle into his chest 22 months previously. The patient was a lunatic.