

Intracardiac Self Insertion of a Darning Needle in a Psychiatric Patient

Ronald Orozco¹, Avra S. Laarakker^{2*}, Brian Castlemain³

¹Division of General Surgery, University of New Mexico, Albuquerque, NM, USA

²Division of Plastics, Hand, and Burn Surgery, University of New Mexico, Albuquerque, NM, USA

³Division of Cardiothoracic Surgery, University of New Mexico, Albuquerque, NM, USA

*Corresponding Author: Avra S. Laarakker, Division of Plastics, Hand, and Burn Surgery, University of New Mexico, UNM School of Medicine MSC 10 5610, 1 University of New Mexico Albuquerque, New Mexico 87131

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Abstract:

Objective: We report a case of self-inserted needle into the left ventricle of the heart and a description of our surgical intervention in a psychiatric patient without decision-making capacity. We discuss issues regarding obtaining consent in this patient with a sub-acute presentation, report our operative approach, and summarize a treatment approach based on a review of current literature.

Methods: A PubMed search using terms “needle”, “heart”, “insertion”, “intracardiac foreign object”, yielded 69 relevant papers. 67 of these were case reports yielding 72 individual cases. Age, gender, cause of the needle entry (Accidental Plus (A+), Intravenous Drug User [IVDU], Self-inflicted (SI)), type of needle, location in heart, neuropsychiatric history, treatment, and outcome were documented.

Results: Within the SI category, there were a total of 28 cases, 89.3% had a neuropsychiatric history whereas only there were only 2 such patients in both the IVDU and A+ group. The location of the needle in the heart in all 72 cases was as follows: right ventricle 40.3%, other 20.8%, left ventricle 19.4%, ventricle and interventricular septum 16.7% and the right and left atrium were each 1.4%. In all three groups (n=72), 77.8% of patients underwent surgery, with 92.9% having a stable outcome.

Conclusion: Our case and review demonstrates that management of such cases, particularly when active mental health issues are present, requires a case-by-case evaluation and treatment as a specific standard of care has not been established. Surgical intervention appears to be the preferred management regardless of presentation with good outcomes.

Key Words: intracardiac needle; self-insertion; acupuncture; darning needle

Running Title: Intracardiac Self Insertion of a Darning Needle in a Psychiatric Patient

Introduction:

Cases of needle self-insertion are not uncommon, and while common causes of chest pain should be considered, in patients with self-injurious or psychiatric history, this pathology should not be excluded. Currently there is no standard of care or guidelines for the management or treatment of needles within the heart. Our review finds that most cases undergo surgical intervention to remove the needle.

We report a case of needle self-insertion into the left ventricle of the heart in a patient with psychiatric illness. We describe our treatment approach by sternotomy and left ventriculotomy, and outline the difficulties encountered with this particular patient. Additionally, we present a review of the literature regarding all published cases, management of intracardiac needles, and specifics of this complex patient population and their presentation.

Case Description:

A 35 year old male with a history of schizophrenia, bipolar disorder, and methamphetamine abuse presented to the emergency department at our institution. He had been transferred from an inpatient psychiatric facility with complaints of sharp and persistent chest pain in the left anterior chest. The patient stated he was having a “heart attack.” He also stated that he had inserted a six centimeter sewing needle into his left anterior chest days prior to relieve the pain and “heal himself.” He had a long history of needle insertion into various areas of his body, believing this practice would improve his health. He was initially evaluated by the general surgery service for a number of needles in the epigastric area, noted on abdominal radiography. These were noted to be extraperitoneal and conservative measures were advised. A CT scan of the chest demonstrated a metallic foreign within the left ventricle, and the cardiothoracic surgical service was consulted (**Figure 1**).



Figure 1: CT Chest with contrast demonstrating intraventricular position of needle.

Notable findings on his evaluation included a troponin of 0.73 ng/cc, an unremarkable ECG, and a transthoracic echocardiogram that revealed a needle completely within the left ventricle, not involving left-sided valves and with no evidence of pericardial effusion. From the time of his arrival in the emergency department, and throughout his pre-surgical course, the patient was asymptomatic. He was admitted for observation and surgical planning. The patient was evaluated by the psychiatry service and deemed

incapable of giving his own consent for surgery. Obtaining power of attorney required several days, but eventually consent was obtained, and the patient was taken to the operating room. Repeat echocardiography prior to operation revealed evidence of thrombus involving the needle and seemed to demonstrate migration of the needle anteriorly in the left ventricle (**Figure 2**).

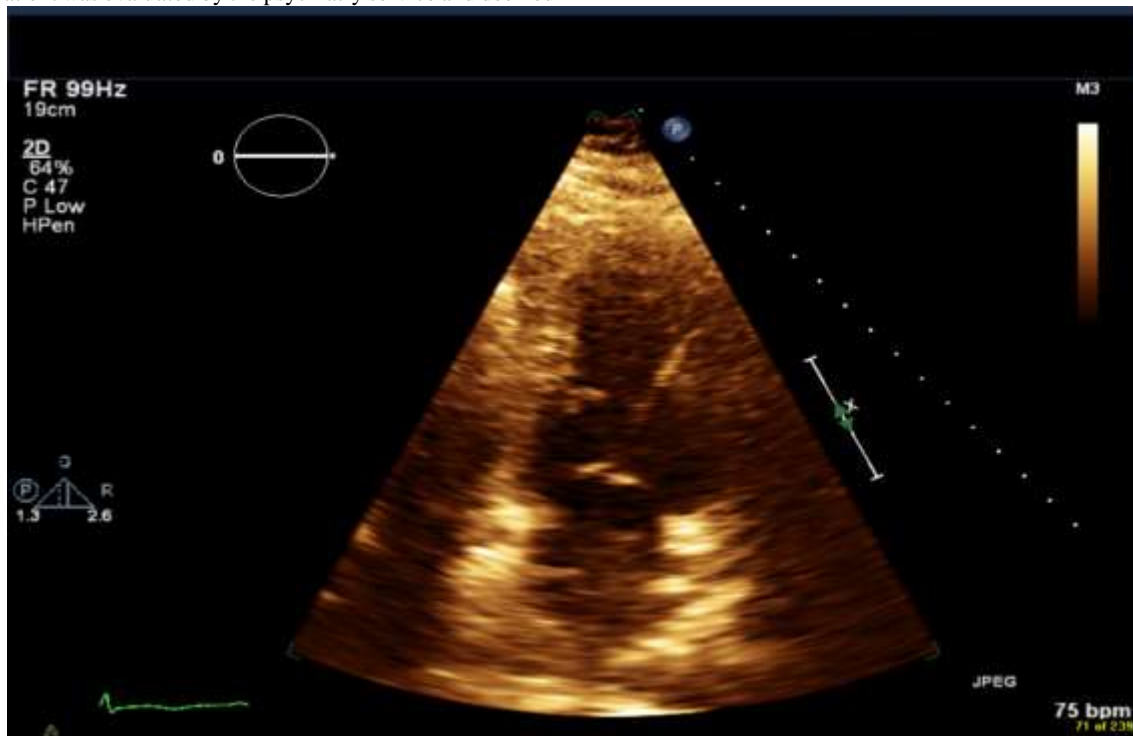


Figure 2: Second Transthoracic Echocardiogram prior to operative intervention demonstrating intraventricular position of needle.

The patient underwent median sternotomy with cardiopulmonary bypass and cardiac arrest to retrieve the needle via a left ventriculotomy due to needle location (**Figure 3**).



Figure 3: Needle after surgical removal measuring 5.8 cm.

Operative findings included the intracavitary needle covered with thrombus, no pericardial effusion, and fibrosis in the area where the needle penetrated the pericardium into the heart. These findings were consistent with needle entry at an earlier time. The patient's postoperative course was uneventful. During his postoperative psychiatric evaluation, the patient reported his desire to continue his self-insertion of needles, and he was transferred back to an inpatient psychiatric facility for further evaluation and treatment.

Materials and Methods:

To perform our literature review, a thorough search of PubMed using search terms "needle", "heart", "insertion", "intracardiac foreign object", yielded 69 relevant papers. 67 of these were case reports yielding 72 individual cases. We included only papers describing "needles" as the intracardiac foreign body.

For each case, age, gender, cause of the needle entry (Accidental Plus, Intravenous Drug User [IVDU], Self-inflicted), type of needle, location in heart, neurologic or cognitive/psychiatric history (denoted as Neuro Psych in tables), treatment, and outcome, were documented. The category "Accidental Plus" was used for patients who were not IVDUs nor needle self-inserters. However, this did include trauma or intentional injury by another person. Patients who were IVDUs were categorized separately as these accounts were not purely accidental nor were they intentionally self-

inflicted. When categorizing the location of the needle, we looked at all chambers of the heart and other locations, but defined needles involving the intraventricular septum as either left or right ventricle or both. We defined "other" location as extracavitary or not specified.

Results:

Our review included 72 cases from 67 case reports [1-67]. For the "Accidental Plus" category there were a total of 34 cases. Of note, 17.6 percent, (6 out of 34) of these cases were acupuncture needles. It appears that in these acupuncture cases, the provider was an unlicensed acupuncturist. In the "Accidental Plus" category, 2.9% (1 of 34) had a neurologic or cognitive/psychiatric history. Among the IVDU category there were a total of 10 cases where only 10% (1 of 10) of these patients had a neurocognitive/psychiatric history. Within the Self-Inflicted category, there were a total of 28 cases, 89.3% (25 of 28) had a neuropsychiatric history. In order of decreasing frequency, the location of the needle in the heart was as follows: right ventricle 40.3% (29 of 72), other 20.8% (15 of 72), left ventricle 19.4 % (14 of 72), ventricle and interventricular septum 16.7% (12 of 72) and the right and left atrium were each 1.4 % (1 of 72). Of note, in IVDUs the needle location was in the right ventricle in all cases. In all instances the atria were unlikely to be involved. In all three groups, treatment favoured surgical intervention with 77.8% (56 of 72) undergoing surgery with 92.9% (52 of 56) having

a stable outcome. The missing patients here were either lost to follow up or outcome was not specified. There was one death in the Accidental Plus category, however the treatment of the patient was not specified. In the Self-Inflicted group, there were three deaths, however these patients were managed conservatively or the treatment was not specified. There did not appear to be a gender predominance in the individual categories or when looking at all three groups together. However, all the patients in the

Acupuncture group were female. A summary of the Appendices can be seen in **Table 1**.

Table 1:

Accidental Plus: 34 Reports

Location		Type of Needle		Treatment		Outcome		Gender		NeuroPsych	
Right Ventricle	9	Sewing	16	Surgery	27	Stable	24	Male	18	Yes	1
Right Atrium	1	Acupuncture	6	Percutaneous	1	Death	2	Female	13	No	33
Ventricle + Interventricular Septum	6	Medical	4	Conservative	2	Lost to follow up	1	Other	3	Other	N/A
Left Ventricle	7	Other (safety pin etc.) / not specified	9	Not Specified	4	Other/ Not specified	7				
Left Atrium	1										
Other	10										

IVDU: 10 Reports

Location		Type of Needle		Treatment		Outcome		Gender		NeuroPsych	
Right Ventricle	10	Sewing	0	Surgery	5	Stable	9	Male	7	Yes	1
Right Atrium	0	Acupuncture	0	Percutaneous	2	Death	0	Female	3	No	9
Ventricle + Interventricular Septum	0	Medical	0	Conservative	3	Lost to follow up	1	Other	0	Other	N/A
Left Ventricle	0	Other (safety pin etc.) / not specified	10	Not Specified	0	Other/ Not specified	0				
Left Atrium	0										
Other	0										

Self-Inflicted: 28 Reports

Location		Type of Needle		Treatment		Outcome		Gender		NeuroPsych	
Right Ventricle	9	Sewing	17	Surgery	25	Stable	16	Male	12	Yes	25
Right Atrium	0	Acupuncture	1	Percutaneous	0	Death	3	Female	16	No	3
Ventricle + Interventricular Septum	6	Medical	0	Conservative	2	Lost to follow up	1	Other	0	Other	N/A
Left Ventricle	4	Other (safety pin etc.) / not specified	10	Not Specified	1	Other/ Not specified	8				
Left Atrium	0										
Other	9										

Totals: 72 reports

Location		Type of Needle		Treatment		Outcome		Gender		NeuroPsych	
Right Ventricle	28	Sewing	33	Surgery	57	Stable	49	Male	37	Yes	27
Right Atrium	1	Acupuncture	7	Percutaneous	3	Death	5	Female	32	No	44
Ventricle + Interventricular Septum	12	Medical	4	Conservative	7	Lost to follow up	3	Other	3	Other	N/A
Left Ventricle	11	Other (safety pin etc.) / not specified	29	Not Specified	5	Other/ Not specified	15				
Left Atrium	1										
Other	19										

Please see individual categories and details in Appendices A-E.

Accidental Plus: 34 Reports

Please see individual categories and details in Appendices A-E.

Appendices: A.

ACCIDENTAL PLUS											
	Gender	Age	Needle Type	Cause	Neuropsych	Location	Treatment	Outcome			
ACTIS DATO, ARSLANIAN, DI MARZIO, FILOSSO, RUFFINI ³²	M	2.5 Years	Not Specified	Accidental	None Reported	Left Ventricle	Left anterior thoracotomy	Stable			
	M	9 Years	Not Specified	Accidental	None Reported	Left Atrium	Left thoracotomy	Not Specified			

	M	51 Years	Not Specified	Accidental	None Reported	Pulmona ry artery	Conservative Treatment	Death: Cancer
AFFRONTI, DI BELLA, DI LAZZARO, CAPOZZI, SCARNECCHIA, RAGNI ³³	M	30 Years	Sewing	Accidental	None Reported	Left Ventricle lateral wall	Sternotomy and heart dissection	Stable
AKPINAR, SAYIN, KARABAG, DOGAN, AYDIN ³⁴	-	34 Years	Safety Pin	Accidental	None Reported	Left ventricle anterolat eral wall	Conservative management	Stable
CHOUDHARY, PUJAR VENKATESHAC HARYA, REDDY ³⁵	M	3 Years	Sewing	Accidental	None Reported	Right heart across tricuspid	Sternotomy and heart dissection	Stable
DARMAWAN ³⁶	M	14 Years	Sewing	Accidental	None Reported	Right Ventricle	Sternotomy did not incise heart	Stable
DONG, ZHAI, LI, CUI, CHEN, WANG ³⁷	F	13 Months	Sewing	Accidental	None Reported	Right ventricle and intervent ricular septum	Sternotomy and heart dissection	Stable
ERNST ³⁸	F	44 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Not Specified	Death
HONIKMAN, CHIKWE, TOKITA, MITTNACHT ³⁹	M	55 Years	14-gauge all metal hemodialysis cannulation needle,	hemodialysis access needle	None Reported	Lateral Right ventricul ar wall, below tricuspid	Ministernoto my and heart dissection	Stable
HSIA, MAHADEVAN, BRUNDAGE ⁴⁰	F	54 Years	Wooden knitting needle	Accidental	None Reported	Right Ventricle	Sternotomy did not incise heart	Stable
IRDEM, BASPINAR, GOKASLAN ⁴¹	M	3 Years	Not Specified	Accidental	None Reported	Right Ventricle	Anterior thoracotomy	Stable
KATAOKA ⁴²	F	69 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Sternotomy did not incise heart	Stable
KIM, YANG, CHOL, SEO, CHUN, LEE, HONG, JOO, CHOI ³¹	F	61 Years	Acupuncture	Acupuncture	None Reported	Not Specified	Not Specified	Not Specified
KOBAYASHI, HAYASHI, SAKATA, KOBAYASHI ⁴³	F	55	Needle like	Unknown	None	Tricuspi d	Sternotomy	Not
		Years	foreign body		Reported	anterior leaflet	and heart dissection	Specified
LAKE, PULESTON, FARQUHARSON ⁴⁴	M	53 Years	Endoscopic	Accidental	None Reported	Left Ventricle into aortic arch	Percutaneous	Stable

LINARD, MARQUES, BEZON, DELAPERRIERE, GERMOUTY, FENOLL, DE VRIES ¹	M	14 Years	Sewing	Accidental	congenital mental retardation	Posterior pericardial side below 4 pulmonary veins	Thoracotomy	Stable
LIU, GILKESON, MARKOWITZ, SCHRODER ⁴⁵	M	46 Years	Suture	Surgical error	None Reported	Under pericardium	Sternotomy did not incise heart	Stable
MANDEGAR, ALI YOUSEFNIA, RAYATZADEH, ROSHANALI ⁴⁶	M	36 Years	Sewing	Domestic abuse	None Reported	Left Ventricle	Sternotomy and heart dissection	Stable
MURAKAMI, OKADA, NISHIDA, HAMANO ⁴⁷	M	14 Years	Sewing	Accidental	None Reported	Intraventricular Septum	Sternotomy and heart dissection	Stable
PAPADOPOULOS, KOUERINIS, GIANNAKOPOULOU, ELEFThERAKIS, ANDREOU, AZARIADES ⁴⁸	M	3 Years	Tropical plant needle	Accidental	None Reported	Right Atrium	Thoracotomy	Stable
PARK, SHIN, CHOO, SONG, KIM ⁴⁹	F	49 Years	Acupuncture	Acupuncture	None Reported	Right ventricular wall and interventricular septum	Sternotomy and heart dissection	Stable
POTEK, WRIGHT ⁵⁰	F	61 Years	Darning needle	Accidental	None Reported	Left Ventricle	Sternotomy and heart dissection	Stable
SANCHEZ, BRADFIELD, TRAINA, WACHSNER ⁵¹	F	57 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Heart dissection	Lost to f/u
SBOKOS, AZARIADES, CHLAPOUTAKIS, VOMVOGIANNIS, NOMIKOS, ANDRITSAKIS ⁵²	-	6 weeks	Sewing	Accidental	None Reported	Left Ventricle through Intraventricular septum into Right Ventricle	Median Sternotomy	Stable
	-	2 Years	Not Specified	Accidental	None Reported	Lateral side of Left chest wall	Median sternotomy under ECC	Not Specified
SCHECHTER, GILBERT ²³	M	34 Years	Not Specified	Accidental	None Reported	Right ventricle and interventricular septum	Left anterior thoracotomy	Stable
SCHULTZ, POST, PLUMLEY,	M	10 Years	Sewing	Accidental	None Reported	Right Ventricle	Sternotomy and heart dissection	Stable

O'BRIEN, DECAMPLI ⁵³								
SOLA, CATERIANO, THOMPSON, NEVILLE ⁵⁴	F	3 Months	Sewing	Intentional parent abuse	None Reported	Not Specified	Subxyphoid incision and removal	Stable
TALWAR, SUBRAMANIAM, SUBRAMANIAN, KOTHARI, KUMAR ⁵⁵	M	4 Years	Sewing	Accidental	None Reported	Right ventricle and interventricular septum	Thoracotomy	Stable
TAN, AZZI, SHARMA ⁵⁶	-	None Reported	hemodialysis cannulation needle	None Reported	None Reported	Not Specified	Not Specified	Not Specified
VAZQUEZ, TAPIA, REVILLA, SAN ROMAN ⁵⁷	M	62 Years	Sewing	Accidental	None Reported	Left Ventricle	Not specified	Not Specified
WIGGER, STORTECKY, MOST, ENGLBERGER ⁵⁸	F	51 Years	Acupuncture	Acupuncture	None Reported	Left Ventricle	Sternotomy and heart dissection	Stable
YANAR, AKSOY, TAVILOGLU, UNAL, KURTOGLU, NISLI ⁵⁹	F	5 Years	Hooked knitting needle	Accidental	None Reported	Right Ventricle	Thoracotomy	Asymptomatic VSD

B.

INTRAVENOUS DRUG USE								
	Gender	Age	Needle Type	Cause	Neuropsych	Location	Treatment	Outcome
AL-SAHAF, HARLING, HARRISON-PHIPPS, BILLE ⁶⁰	M	39 Years	Hypodermic	IVDU needle	None Reported	Right Ventricle septal wall into mediastinum	Thoracotomy	Stable
BOMPOTIS, KARKANIS, CHATZIAVRAMIDIS, KONSTANTINIDIS, DOKOPOULOS, LAZARIDIS, PYRIOCHOS ³⁰	M	47 Years	insulin needle	IVDU needle	None Reported	Apex of Right Ventricle	Percutaneous	Stable
DANEK, KUCHYNKA, PALECEK, CERNY, HLAVACEK, LAMBERT, NEMECEK, PODZIMKOVA, LINHART ⁶¹	M	27 Years	Not Specified	IVDU needle	None Reported	Apex of Right Ventricle	Conservative management, needle left in place	Stable
FU, CHEN, LIAO, SHEN ⁶²	M	40 Years	Not Specified	IVDU needle	None Reported	Right Ventricle	Sternotomy did not incise heart	Stable
GYRTRUP, ANDREASSEN, PEDERSEN, MORTENSEN ⁶³	M	32 Years	Hypodermic Needle	IVDU needle	None Reported	Right Ventricle	Thoracotomy	Lost to follow up

LEMAIRE, WALL, MATTOX ⁶⁴	F	31 Years	27g hollow needle	IVDU needle	None Reported	Apex of Right Ventricle	Sternotomy did not incise heart	Stable
LOW, JENKINS, PRENDERGAST ⁶⁵	M	28 Years	Not Specified	IVDU needle	None Reported	Right Ventricle	Conservative management	Stable
NGAAGE, COWEN ²	F	22 Years	Not Specified	IVDU needle	Depression, attempted suicide	Right Ventricle	Conservative management, patient refused surgery	Stable
STEINER, DHINGRA, DEVRIES ⁶⁶	M	24 Years	Not Specified	IVDU needle	None Reported	Right Ventricle	Percutaneous	stable
THANAVARO, SHAFI, ROBERTS, COWLEY, ARROWOOD, CASSANO, ABBATE ⁶⁷	F	49 Years	Not Specified	IVDU needle	None Reported	Right Ventricle	Surgery: Sternotomy did not incise heart	Stable

C.

SELF INFLICTED								
	Gender	Age	Needle Type	Cause	Neuropsych	Location	Treatment	Outcome
ARSLAN, COLKESEN, AKCAN, HILAL, MERAL ³	M	46 Years	Tapestry needle	Self Inflicted	Depression	Apex to Left Ventricle	Not specified	Death, suicide
CHAND, SARJU, KUMAR, SINGH ⁴	M	20 Years	Not Specified	Self Inflicted	History of suicidal tendencies	Apex	Sternotomy did not incise heart	Stable
DWIVEDI, GUPTA, NARAIN ⁵	M	40 Years	Not Specified	Self Inflicted	Hebephrenic-schizophrenic	Right Ventricle though interventricular septum into Left Ventricle	Median sternotomy under ECC	Not Specified
GALLERANI, FERRARI, MAGENTA, BARBOSO, ANTONELLI, MANFREDINI ⁶	M	34 Years	Darning needle	Self Inflicted	Borderline personality disorder	Right Ventricle	Median sternotomy without ECC	Stable
GUNGOR, DUYGU, YILDIZ, GUL, ZOGHL, OZERKAN ⁷	M	32 Years	Sewing	Self Inflicted	depression	Right Ventricle	Sternotomy bypass	Stable
INOUE, IEMURA, SAGA ⁸	F	47 Years	Not Specified	Self Inflicted	Depressive Psychosis	Left Ventricle and Right Ventricle	Median sternotomy without ECC	Not Specified
JAMILLA, CASEY ⁹	M	42 Years	Sewing	Self Inflicted	History of depression, suicide attempts, self harm	Left Ventricle	Surgery not indicated	Lost to f/u
KEOGH, OAKLEY, TAYLOR ¹⁰	F	34 Years	Sewing	Self Inflicted	Depressive psychosis	Pericardium, Adventitia of ascending aorta	Median sternotomy, pericardiectomy	Not Specified

KESKIN, SEN, BAYSAL, KAHRAMAN ¹¹	M	49 Years	Sewing	Self Inflicted	Schizophrenia	Apex to Left Ventricle	Sternotomy did not incise heart	Stable
KISHON, PAUZNER, DALITH, NEUFELD ¹²	F	32 Years	Not Specified	Self Inflicted	Suicide Attempt	Right Ventricle	Median sternotomy, pericardiectomy	Stable
	F	32 Years	Not Specified	Self Inflicted	Suicide Attempt	Right Ventricle	Median sternotomy, pericardiectomy	Stable
LIN, YONEYAMA, TAKAHASHI-IGARI, OHTO, SAKAMOTO ¹³	F	14 Years	Not Specified	Self Inflicted	Tuberous Sclerosis Complex-TAND	Right ventricle and interventricular septum	Sternotomy and heart dissection	Moderate left ventricular dysfunction
MIHMANLI, KURUGOGLU, KANTARCI, ATAKIR, AKMAN ¹⁴	F	12 Years	Sewing	Self Inflicted	Attempted Suicide	Lateral wall of Left Ventricle	Median Sternotomy without ECC	Stable
MOCHIZUKI, SUGITA, OKAMURA, IIDA, MORI, SHIMADA ¹⁵	F	17 Years	Not Specified	Self Inflicted	History of self harm	Right Ventricle	ECC and Fluoroscopy	Not Specified
MOON, JO, SONG, KIM ¹⁶	F	59 Years	Sewing	Self Inflicted	MDD, history of self injury	Right ventricle and interventricular septum	Sternotomy and heart dissection	stable to psych unit
MORRISON, HEYWORTH ¹⁷	M	22 Years	Sewing	Self Inflicted	Personality disorder and depression	Through LAD into LV	Median sternotomy under ECC	Stable
NEELY, JEGANATHAN, CAMPALANI ¹⁸	M	30 Years	acupuncture	Self Inflicted	History of self harm	Right Ventricle	Sternotomy and heart dissection	Stable
NISHIDA, TOMITA, WATANABE, YASUDA, IINO, ARAI ¹⁹	F	72 Years	Not Specified	Self Inflicted	History of Dementia	Left Ventricle and Right Ventricle through the interventricular septum	Median sternotomy under ECC	Not Specified
PARK, JEONG, LEE, JEONG ²⁰	F	54 Years	Not Specified	Swallowed needle, self inflicted	None Reported	R Ventricle into septal leaflet	Sternotomy did not incise heart	Mild tricuspid regurgitation
QIAN, SONG, LI, JIANG ²¹	M	34 Years	Sewing	Self Inflicted	History of depression, self harm	Left Ventricle	Thoracotomy	Stable
	F	62 Years	Sewing	Self Inflicted	Depression, suicide attempt	Right Ventricle	Thoracotomy	stable to psych unit
SAYIN, BESIRLI, ARSLAN, CANTURK ²²	F	13 Years	Sewing	Self Inflicted	Prepsychotic episode and depression	Left Ventricle across interventricular septum	Median sternotomy without ECC	Not Specified
SCHECHTER, GILBERT ²³	F	34 Years	Not Specified	Self Inflicted	Depression	Anterior surface of	Left anterior thoracotomy	Stable

						Right Ventricle		
	F	29 Years	Sewing	Self Inflicted	None Reported	Pericardial fat over Right Ventricle	Left anterior thoracotomy	Stable
SOBNACH S, CASTILLO F, BLANCO VINENT R, KAHN D, BHYAT A ²⁴	M	19 Years	Sewing needle	Swallowed needle, self inflicted	None Reported	Left Ventricle	Sternotomy did not incise heart	Stable
TAN, BRUNSWICKER, ABDELRAHEEM M, SHEEHAN ²⁵	F	39 Years	Sewing	Self Inflicted	Cerebral Palsy	Needle tip at myocardium	Palliative	Death: hypoxic brain injury
ULAS, KOCABEYOGLU, DIKEN, LAFCI, YALCINKAYA ²⁶	F	25 Years	Sewing	Self Inflicted	Under antipsychotic treatment	Right Ventricle	Sternotomy and heart dissection	Stable
VESNA, TATJANA, SLOBODAN, SLOBODAN ²⁷	F	20 Years	Sewing	Self Inflicted	Acute Psychosis	Left Ventricle across interventricular septum	Misdiagnosis	Death

D.

ACUPUNCTURE								
	Gender	Age	Needle Type	Cause	Neuropsych	Location	Treatment	Outcome
ERNST ³⁸	F	44 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Not Specified	Death
KATAOKA ⁴²	F	69 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Sternotomy did not incise heart	Stable
KIM, YANG, CHOI, SEO, CHUN, LEE, HONG, JOO, CHOI ³¹	F	61 Years	Acupuncture	Acupuncture	None Reported	Not Specified	Not Specified	Not Specified
PARK, SHIN, CHOO, SONG, KIM ⁴⁹	F	49 Years	Acupuncture	Acupuncture	None Reported	Right ventricular wall and interventricular septum	Sternotomy and heart dissection	Stable
SANCHEZ, BRADFIELD, TRAINA, WACHSNER ⁵¹	F	57 Years	Acupuncture	Acupuncture	None Reported	Right Ventricle	Heart dissection	Lost to follow up
WIGGER, STORTECKY, MOST, ENGLBERGER ⁵⁸	F	51 Years	Acupuncture	Acupuncture	None Reported	Left Ventricle	Sternotomy and heart dissection	Stable

Discussion:

Self-insertion of needles into the heart, particularly among neuropsychiatric patients, has been frequently reported in the literature,

as described above [1-27]. Our patient's subacute presentation, the apparent needle migration within the ventricle, and the difficulty in obtaining consent, all presented challenging aspects of this particular case. The potential risks of a needle within the heart of pericardium are

protean. These include acute or delayed cardiac tamponade, pericarditis, endocarditis, acute thrombus formation, thromboembolism, and recurrent local and systemic infection [22]. The heart may be more vulnerable to serious injury, when the foreign body is extraventricular rather than completely intraventricular per Perotta et al [28]. They posit that the repetitive wall motion of the heart against a fixed foreign body has the potential for bleeding and/or infection with subsequent tamponade. They also suggest that less symptomatic patients or those with delayed presentation and evidence of fibrosed or non-mobile foreign bodies within the cardiac space could possibly be managed conservatively [5].

As far as diagnosis of this pathology, initial patient history and chest plain film should suffice. The patients' clinical presentation, like in our case, could be delayed, in which asymptomatic patients could suffer sequelae mentioned. We found that in recent reports management of foreign bodies, specifically needles within the heart, still requires a case by case evaluation and treatment. Depending on location and accessibility, endovascular, percutaneous, thorascopic, or thoracotomy approaches might be utilized. Alternatively, with any evidence of intracardiac penetration, the safest approach involves sternotomy with or without the use of cardiopulmonary bypass [29-31]. From the literature, there are general guidelines regarding indications for surgical intervention.

Size of needle was not a criteria-determining intervention within the literature reviewed, however, our opinion left ventricular needles should be treated urgently or emergently because of the possibility of embolization to vital structures. Any intracavitary needle regardless of size should be considered for removal. Symptomatic needles (foreign bodies) manifesting with infection, arrhythmia, bleeding, or neurologic findings, should be removed [22]. As Perrota et al concludes in their review, intracardiac needles should be promptly taken for intraoperative removal, especially if the needle is within the myocardium.

Asymptomatic foreign bodies discovered soon after injury with associated risk of infection, embolization, or erosion should be removed. Asymptomatic foreign bodies demonstrating fibrosis or fixation within the myocardium, pericardium, or pericardial space, may be able to be treated conservatively with some form of serial examination going forward [28,32]. Our results also demonstrate that acupuncture under an unlicensed acupuncturist is not benign. Our review demonstrates the safety of surgical intervention with favorable and predictable outcomes; it may be the preferred management approach regardless of presentation.

Limitations of our study revolve around the difficulty of drawing conclusions from a vast collection of case reports with varying levels of detail regarding both the presentation and management.

Conclusion:

In conclusion, patients with neuropsychiatric illness and history of needle self-insertion, particularly into the cardiac space, invariably produce a challenging treatment problem involving psychosocial, physiologic, and follow-up dilemmas. These patients may be best served with an operative approach for needle extraction.

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