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Review

Cardiac hydatid cyst in the interventricular septum: A literature review

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ABSTRACT

Human hydatidosis occurs mainly as a result of infection with the larvae of *Echinococcus granulosus*. Cardiac echinococcosis is an uncommon disease and the interventricular septum is rarely involved. This article is a review of all of the literature related to hydatid cyst in the interventricular septum included in the PubMed database. Forty-five cases reported between 1964 and 2019 were identified.

Contents

Introduction

Cardiac hydatid cyst is found to be endemic in countries where livestock are raised. The disease affects both sexes equally and has more often been seen in young persons. Chest pain, dyspnea, palpitations, and cough are the primary symptoms. Echocardiography is a preferred and effective modality for the diagnosis of cardiac hydatidosis. This has been the initial modality used for diagnosis in all patients. Computed tomography scans (CT) and magnetic resonance imaging (MRI) provide a detailed characterization of the cysts, such as the extent and anatomical relationships

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of the cysts, and have been used in more than half of the patients. Serological tests are a helpful supplement, but false-negative results are possible. Eosinophilia is a common finding in patients with parasitic infections, but this has not always been seen. Surgical excision is performed in the vast majority of cases. Albendazole has been used for preoperative sterilization and during the postoperative period for up to 6 months to prevent recurrence. Fortunately, cystectomy is associated with a high rate of complete recovery.

Parasitology

Human hydatidosis occurs mainly as a result of infection with the larvae of *Echinococcus granulosus*. Most often, dogs and other carnivores are the primary hosts and sheep are intermediate hosts, whereas humans are accidental hosts. Adult helminths mature in the intestinal mucosa of the final host who ate the uncooked cyst-containing meat from the intermediate host. Humans usually become infected by ingesting food, milk, or water contaminated by dog feces containing the ova of the parasite. When a human ingests the eggs, embryos escape from the eggs, penetrate the intestinal mucosa and enter the portal circulation. Most of them are filtered out by the liver or the lungs, but some escape into the systemic circulation to involve the tissues.

The most common sites of hydatid cysts (HC) are the liver (in 50–70% of cases), lungs (5–30%), muscles (5%), bones (3%), kidneys (2%), spleen (1%), and brain (1%) (Yaman and Sirlak, 2017). Cardiac echinococcosis is an uncommon disease, with an estimated prevalence ranging from 0.5% to 2% (Yaman and Sirlak, 2017). The distribution of echinococcosis in the heart depends on the blood supply to that part of the heart. The coronary circulation is the main pathway by which the parasitic larvae reach the heart. Cardiac involvement through pulmonary veins has also been reported. Due to the rich coronary blood supply, the left ventricular wall is the most common cardiac location (60%), followed by the right ventricle (10%), pericardium (7%), left atrium (6–8%), and right atrium (3–4%) (Yaman and Sirlak, 2017). The interventricular septum (IVS) is less frequently involved. It is reported in just 4% of cardiac cases (Yaman and Sirlak, 2017).

This review of the PubMed database identified only 45 cases of HC in the IVS reported between 1964 and 2019 (Table 1).

Epidemiology

HC of the IVS is endemic countries where livestock are raised. Most cases have been reported from Turkey (33%) (Tetik et al., 2002; Ozer et al., 2001; Atilgan et al., 2002; Darçin et al., 2003; Ugurlucan et al., 2006; Selcuk et al., 2008; Ipek et al., 2011; Gocen et al., 2014; Altaş et al., 2014; Şahin et al., 2015; Sahin et al., 2015; Sağlıcan et al., 2016; Yaman et al., 2016). It was found that the two sexes are equally affected (female to male ratio 1:1) and the median age of those affected was 32 years (Ernst et al., 1983; Jean et al., 1997) (Di Bello et al., 1964; Ernst et al., 1983; Cantoni et al., 1993; Jean et al., 1997; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Ozer et al., 2001; Atilgan et al., 2002; Darçin et al., 2003; Achouh et al., 2004; Ugurlucan et al., 2006; Muthu et al., 2007; Selcuk et al., 2008; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Bonardi et al., 2012; Ipek et al., 2011; Besir et al., 2013; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Alshehri et al., 2014; Sabzi and Faraji, 2014; Altaş et al., 2014; Salehi et al., 2015; Jain et al., 2015; Şahin et al., 2015; Sahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Sağlıcan et al., 2016; Mirijello et al., 2016; Yaman et al., 2016; Jan and Aasim, 2016; Tefera et al., 2017; Fennira et al., 2019; Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018).

Clinical presentation

Symptomatic patients

Clinical signs and symptoms were found to vary according to the number, size, site, and effect of the cysts. Chest pain, dyspnea, palpitations, and cough were the primary symptoms associated with HC of the IVS in 32 patients (71%) (Di Bello et al., 1964; Ernst et al., 1983; Tetik et al., 2002; Ozer et al., 2001; Atilgan et al., 2002; Achouh et al., 2004; Ugurlucan et al., 2006; Muthu et al., 2007; Selcuk et al., 2008; Ilic et al., 2008; Mohsen et al., 2009; Ipek et al., 2011; Besir et al., 2013; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Alshehri et al., 2014; Altaş et al., 2014; Parakh et al., 2016; Sağlıcan et al., 2016; Yaman et al., 2016; Jan and Aasim, 2016; Tefera et al., 2017; Fennira et al., 2019; Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018).

Asymptomatic patients

Five patients were asymptomatic. In one patient, HC of the IVS appeared as a round opacity on chest X-ray on routine examination for a food handler job (Cantoni et al., 1993). In two patients, HC of the IVS was discovered on transthoracic echocardiography (TTE) exploring a systolic heart murmur (Jean et al., 1997; Maroto et al., 1998). In the fourth patient, HC was found on TTE done for ischemic changes on his electrocardiogram (ECG) as a part of the preoperative assessment of a prostate biopsy (Eroglua et al., 2009). Finally, in the fifth patient, HC of the IVS was diagnosed on TTE done as part of routine follow-up of arterial hypertension (Salehi et al., 2015).

Chest pain is a common symptom and mostly does not resemble angina pectoris. Palpitations are due to irritation of the conduction fibers in the ventricular septum. Compression of the conduction pathway can cause atrio-ventricular block (Toquero et al., 2000; Sabzi and Faraji, 2014), and obstruction of the right or left ventricular outflow tract (Di Bello et al., 1964; Maroto et al., 1998; Tetik et al., 2002; Selcuk et al., 2008; Mohsen et al., 2009; Bonardi et al., 2012; Besir et al., 2013; Jain et al., 2015; Alis and Turna, 2018) can result in dyspnea and syncope attacks (Di Bello et al., 1964; Besir et al., 2013; Jain et al., 2015). The other reported cardiovascular manifestations of HC of the IVS were valvular dysfunction (Tetik et al., 2002; Besir et al., 2013; Naeem et al., 2015) and pericardial reaction (Ugurlucan et al., 2006). Rupture is a serious complication of cardiac hydatid cyst. It may induce life-threatening anaphylactic shock (Ilic et al., 2008; Mirijello et al., 2016) and systemic or pulmonary emboli (Ozer et al., 2001; Ilic et al., 2008; Hela et al., 2016). Thus, the clinical presentation of cardiac hydatid disease is variable and the clinical diagnosis is difficult.

Paraclinical findings

ECG abnormalities such as Q waves and inverted T waves in the inferior leads may occur (Di Bello et al., 1964; Cantoni et al., 1993; Selcuk et al., 2008; Mohsen et al., 2009; Bonardi et al., 2012; Naeem et al., 2015; Alis and Turna, 2018; Agarwal et al., 2018). Chest radiographs usually show a normal cardiothoracic ratio or cardiomegaly (Di Bello et al., 1964; Ernst et al., 1983; Cantoni et al., 1993; Jean et al., 1997; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Ozer et al., 2001; Atilgan et al., 2002; Darçin et al., 2003; Achouh et al., 2004; Ugurlucan et al., 2006; Muthu et al., 2007; Selcuk et al., 2008; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Bonardi et al., 2012; Ipek et al., 2011; Besir et al., 2013; Naeem et al., 2015; Jain et al., 2015; Şahin et al., 2015; Sahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Jan and Aasim, 2016; Tefera et al., 2017; Fennira et al., 2019;

Table 1
Diagnostic and therapeutic data of reported cases.

Author	Age (years)	Sex	Country	Symptoms	Diagnosis	Size (mm)	Serology	Eosinophil count	Medication	Surgery	Histology	Follow-up (duration)
Di Bello et al. (1964)	26	Male	Uruguay	Dyspnea	TTE	60 mm	Positive	High	NR	OHS	NR	Uneventful (NR)
Ernst et al. (1983)	25	Female	Yugoslavia	Dyspnea Chest pain Fever	TTE	NR	Negative	NR	NR	OHS	NR	Uneventful (NR)
Cantoni et al. (1993)	30	Female	Italy	No symptoms	MRI	32 × 35 mm	Positive	NR	NR	OHS	NR	Uneventful (NR)
Jean et al. (1997)	22	Female	Texas	No symptoms	TTE TTE TEE CT MRI	30 × 30 mm	Positive	Normal	NR	OHS	Positive	Uneventful (NR)
Maroto et al. (1998)	3.5	Male	Spain	No symptoms	TTE	30 × 20 mm	Negative	NR	NR	OHS	Positive	Uneventful (18 months)
Toquero et al. (2000)	35	Male	Spain	Dizziness Atrio-ventricular block	TTE MRI	40 × 30 mm	Positive	High	Albendazole	OHS	Positive	Uneventful (6 months)
Tetik et al. (2002)	25	Female	Turkey	Dyspnea	TTE MRI	50 × 60 mm	Positive	NR	NR	OHS	NR	NR
Özer et al., (2001)	17	Male	Turkey	Dyspnea Cough	NR	NR	NR	NR	NR	OHS	NR	Uneventful (2 years)
Özer et al., (2001)	70	Male	Turkey	Right leg pain	NR	NR	NR	NR	NR	No surgery (patient refused)	NR	No follow-up
Atilgan et al. (2002)	51	Female	Turkey	Dyspnea	MRI	15 × 15 mm	NR	NR	Albendazole	No surgery (multiple cysts)	NR	NR
Darçin et al. (2003)	20	Male	Turkey	NR	CT	NR	NR	NR	NR	OHS	NR	NR
Achouh et al. (2004)	52	Male	France	Atypical chest pain	TEE	49 × 57 mm	Positive	NR	NR	OHS	Positive	NR
Ugurlucan et al. (2006)	12	Female	Turkey	Dyspnea Palpitation	TEE MRI	57 × 53 mm	NR	NR	NR	OHS	Positive	NR
Muthu et al. (2007)	32	Male	UK	Dyspnea Chest pain Hemoptysis	TTE CT MRI	60 × 45 mm	Positive	NR	NR	OHS	NR	NR
Muthu et al. (2007)	27	Female	UK	Dyspnea Chest pain	TTE CT MRI	75 × 67 mm	NR	NR	Albendazole 10 mg/kg before surgery (10 days)	OHS	Positive	NR
Selcuk et al. (2008)	54	Female	Turkey	Dyspnea	CT	51 × 39 × 38 mm	NR	NR	Albendazole	OHS	NR	Uneventful (NR)
Ilic et al. (2008)	13	Male	Serbia	Chest pain Chest pain Nausea Face rash Fever	TEE	NR	Positive	High	Albendazole	OHS	Positive	Uneventful (NR)
Eroglua et al., (2009)	55	Male	Italy	No symptoms	TEE	54 × 37 mm	Positive	NR	NR	OHS	Positive	Uneventful (1 month)

Table 1 (*Continued*)

Author	Age (years)	Sex	Country	Symptoms	Diagnosis	Size (mm)	Serology	Eosinophil count	Medication	Surgery	Histology	Follow-up (duration)
Mohsen et al. (2009)	5	Male	Egypt	Dyspnea	MRI TEE	21 × 23 mm	NR	NR	NR	OHS	NR	Uneventful (NR)
Mohsen et al. (2009)	4	Male	Egypt	Fatigability Palpitations	MRI TEE	30 × 30 mm	NR	NR	NR	OHS	NR	Uneventful (NR)
Bonardi et al. (2012)	42	Male	Italy	Dyspnea Ventricular tachycardia Fatigue	MRI TEE	66 × 39 mm	NR	NR	NR	No surgery (DCM)	NR	NR
Ipek et al. (2011)	39	Female	Turkey	Dyspnea	TEE	50 × 55 mm	Positive	NR	Albendazole 400 mg twice daily before (5 days) and after surgery (12 weeks)	OHS	NR	Uneventful (2 years)
Besir et al. (2013)	54	Female	Indian	Dyspnea	CT MRI TEE	54 × 59 mm	Positive	High	Albendazole	OHS	Positive	Uneventful (NR)
Naeem et al. (2015)	48	Female	Afghanistan	Chest pain Malaise Dyspnea	MRI TTE	22 × 30 mm	Negative	NR	Albendazole 400 mg twice daily after surgery	OHS	Positive	Uneventful (6 months)
Sabzi and Faraji (2013)	44	Male	Iran	Loss of appetite Dyspnea	CT TTE	65 × 55 mm	Positive	NR	NR	OHS	Positive	NR
Gocen et al. (2014)	06	Female	Turkey	Chest pain Chest pain	TTE	40 × 30 mm	Positive	NR	Albendazole 200 mg twice a day in 3 cycles of treatment for 28 days with a break of 14 days	OHS	Positive	Uneventful (6 months)
Alshehri et al. (2014)	29	Female	Saudi Arabia	Dyspnea Palpitations	TTE	70 × 60 mm	Negative	Normal	Albendazole 400 mg daily before (5 days) and after (4 months) surgery	OHS	Positive	NR
Sabzi and Faraji (2014)	55	Female	Iran	Dyspnea	CT MRI TTE	Large	Negative	NR	Albendazole 400 mg before (5 days) and after (4 months) surgery	OHS	NR	Uneventful (1 year)
Altaş et al. (2014)	24	Male	Turkey	Bradycardia Atrio-ventricular block Dyspnea	TEE	48 × 28 mm	NR	NR	Albendazole 800 mg/day	OHS	NR	Uneventful (NR)
Salehi et al. (2015)	54	Female	Iran	Fatigue Chest pain No symptoms	TTE	85 × 65 mm	NR	NR	NR	OHS	Positive	Uneventful (6 months)
Jain et al. (2015)	52	Female	India	Presyncope	CT CT	90 × 80 mm	Positive	NR	Albendazole after surgery	OHS	NR	NR

Table 1 (*Continued*)

Author	Age (years)	Sex	Country	Symptoms	Diagnosis	Size (mm)	Serology	Eosinophil count	Medication	Surgery	Histology	Follow-up (duration)
					MRI TTE							
Şahin et al. (2015)	22	Male	Turkey	Dyspnea	TEE	Huge	NR	NR	NR	OHS	Positive	NR
Sahin et al. (2015)	17	Male	Turkey	Ventricular tachycardia	TTE TEE CT	35 × 66 mm	Positive	NR	Albendazole after surgery	OHS	Positive	Uneventful (2 months)
Hela et al. (2016)	30	Male	Tunisia	Upper member ischemia	TTE CT	29 × 27 mm	NR	NR	Albendazole	OHS	NR	Uneventful (NR)
Parakh et al. (2016)	52	Female	India	Dyspnea	TTE	100 × 80 mm	NR	NR	NR	OHS	Positive	Dead
Sağlıcan et al. (2016)	35	Female	Turkey	Dizziness Palpitations	MRI CT MRI	65 × 50 mm	Positive	NR	Albendazole after surgery	OHS	Positive	Uneventful (1 year)
Mirijello et al. (2016)	23	Male	Italy	Dyspnea Loss of consciousness	TTE TTE MRI CT	51 × 43 mm	Positive	NR	Albendazole	OHS	NR	Uneventful (NR)
Yaman et al. (2016)	33	Female	Turkey	Chest pain during C-section surgery Ventricular tachycardia	TTE	28 × 36 mm	Positive	High	NR	No surgery (dead)	Positive	Dead
Jan and Aasim (2016)	35	Female	Pakistan	Fatigue Palpitations Syncope Heaviness of chest	TTE CT	40 × 35 mm	Negative	Normal	Albendazole 400 mg × 2 before and after surgery	OHS	Positive	Uneventful (NR)
Tefera et al. (2017)	9	Female	USA	Palpitations Cough	TTE	38 × 34 mm	NR	NR	Albendazole	OHS	NR	Uneventful (3 years)
Fennira et al. (2019)	26	Male	Tunisia	Chest pain Asthenia	TTE MRI	48 × 49 mm	Positive	Normal	Albendazole 3 months preoperative	OHS	NR	Uneventful (1 year)
Wadhawa et al. (2018)	32	Female	India	Dyspnea Chest pain Fatigue	TTE	50 × 40 mm	Negative	NR	Albendazole therapy 400 mg twice daily for 12 weeks	OHS	Positive	NR
Alis and Turna (2018)	18	Male	Turkey	Dyspnea Chest pain	TTE CT MRI	55 × 60 mm	Positive	NR	NR	No surgery (patient refused)	NR	NR
Agarwal et al. (2018)	55	Female	India	Chest pain Cough Hemoptysis	TTE MRI	95 × 120 mm	Positive	NR	Albendazole 400 mg twice a day, before (5 days) and after (12 weeks) surgery	OHS	NR	Uneventful (NR)

TTE: transthoracic echocardiography; TEE: transesophageal echocardiogram; CT: computerized tomography scans; MRI: Magnetic resonance imaging; NR: not reported; OHS: open heart surgery; DCM: Dilated cardiomyopathy.

Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018). Echocardiography is a preferred and effective modality for the diagnosis of cardiac hydatidosis. It was the initial modality for the diagnosis in all patients. This modality shows the cyst(s), their location(s) in the IVS, their number, and their size, as well as the hemodynamic compromise and eventual complications such as pericardial effusion (Ugurlucan et al., 2006). Cyst size varied between 15 × 15 mm and 120 × 95 mm (Di Bello et al., 1964; Tefera et al., 2017; Fennira et al., 2019; Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018). In one case, HC of the IVS was associated with multiple pericardial cysts (Atilgan et al., 2002).

In cases of HC of the IVS, the differential diagnosis on echocardiography should include cardiac tumors, thrombus, myxoma, and other rare intracardiac tumors such a sarcoma.

If HC is indistinguishable by echocardiography, MRI can provide conclusive information. This imaging modality was useful in 21 cases (Cantoni et al., 1993; Jean et al., 1997; Toquero et al., 2000; Tetik et al., 2002; Atilgan et al., 2002; Ugurlucan et al., 2006; Muthu et al., 2007; Eroglua et al., 2009; Mohsen et al., 2009; Ipek et al., 2011; Besir et al., 2013; Alshehri et al., 2014; Jain et al., 2015; Parakh et al., 2016; Sağlıcan et al., 2016; Mirijello et al., 2016; Fennira et al., 2019; Alis and Turna, 2018; Agarwal et al., 2018).

CT and MRI provide a detailed characterization of the cysts, such as the extent and anatomical relationships of the cysts, and these were used in 27 cases (Jean et al., 1997; Darçin et al., 2003; Muthu et al., 2007; Selcuk et al., 2008; Ipek et al., 2011; Naeem et al., 2015; Alshehri et al., 2014; Salehi et al., 2015; Jain et al., 2015; Sahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Mirijello et al., 2016; Jan and Aasim, 2016; Alis and Turna, 2018).

Serological tests are a helpful supplement, but false-negative results are possible. Such tests were performed in 28 patients and the result was negative in seven infected patients (25%) (Ernst et al., 1983; Maroto et al., 1998; Naeem et al., 2015; Alshehri et al., 2014; Sabzi and Faraji, 2014; Jan and Aasim, 2016; Wadhawa et al., 2018).

Eosinophilia is a common finding in patients with parasitic infections. The eosinophilia count was performed in nine patients (20%) (Di Bello et al., 1964; Jean et al., 1997; Toquero et al., 2000; Ilic et al., 2008; Besir et al., 2013; Alshehri et al., 2014; Yaman et al., 2016; Jan and Aasim, 2016; Fennira et al., 2019) and was found to be negative in four patients (8%) (Jean et al., 1997; Alshehri et al., 2014; Jan and Aasim, 2016; Fennira et al., 2019).

Treatment approach

Surgery

As there is still no effective medical treatment for cardiac cysts, the treatment of hydatid cyst disease is surgical. This should not be delayed, since medical therapy does not offer assurance against the rupture of the cyst and its potential life-threatening complications.

Surgical excision was performed in most patients (80%) (Di Bello et al., 1964; Ernst et al., 1983; Cantoni et al., 1993; Jean et al., 1997; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Darçin et al., 2003; Achouh et al., 2004; Ugurlucan et al., 2006; Muthu et al., 2007; Selcuk et al., 2008; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Ipek et al., 2011; Besir et al., 2013; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Alshehri et al., 2014; Sabzi and Faraji, 2014; Altaş et al., 2014; Salehi et al., 2015; Jain et al., 2015; Şahin et al., 2015; Sahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Sağlıcan et al., 2016; Mirijello et al., 2016; Jan and Aasim, 2016; Tefera et al., 2017; Fennira et al., 2019; Wadhawa et al., 2018; Agarwal et al., 2018). Medical treatment was the only option for two patients: one had multiple cysts in the heart (Atilgan et al., 2002) and the other had dilated cardiomyopathy, which would increase the surgical risk (Bonardi et al., 2012). Two patients refused all treatment (Ozer et al., 2001; Alis and Turna, 2018) and one patient died before surgery (Yaman et al., 2016).

In deciding upon an operative technique, the location of the cyst is of great importance. Most cysts in the IVS were resected under cardiopulmonary bypass (Di Bello et al., 1964; Ernst et al., 1983; Cantoni et al., 1993; Jean et al., 1997; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Darçin et al., 2003; Achouh et al., 2004; Ugurlucan et al., 2006; Muthu et al., 2007; Selcuk et al., 2008; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Ipek et al., 2011; Besir et al., 2013; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Alshehri et al., 2014; Sabzi and Faraji, 2014; Altaş et al., 2014; Salehi et al., 2015; Jain et al., 2015; Şahin et al., 2015; Sahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Sağlıcan et al., 2016; Mirijello et al., 2016; Jan and Aasim, 2016; Tefera et al., 2017; Fennira et al., 2019; Wadhawa et al., 2018; Agarwal et al., 2018), because they are difficult to approach. When a HC is scheduled for removal, it should be sterilized before enucleation by injection or instillation of a helminthicide: 2% formalin, 0.5% silver nitrate solution, 20% hypertonic saline solution, 1% iodine solution, or 5% cetrimonium bromide solution. The use of substances toxic to the patient (such as formalin and absolute alcohol) should be reserved for application in areas where they cannot enter the bloodstream. A solution of 20% hypertonic saline must be injected. Pads soaked in an aqueous sodium chloride solution can also be used to good effect in protecting the surgical field (Ozer et al., 2001).

In 21 cases, the contents and membranes of the cysts were reported to have been analyzed postoperatively (Di Bello et al., 1964; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Ugurlucan et al., 2006; Muthu et al., 2007; Ilic et al., 2008; Mohsen et al., 2009; Bonardi et al., 2012; Naeem et al., 2015; Gocen et al., 2014; Alshehri et al., 2014; Sabzi and Faraji, 2014; Altaş et al., 2014; Şahin et al., 2015; Hela et al., 2016; Parakh et al., 2016; Mirijello et al., 2016; Tefera et al., 2017; Fennira et al., 2019; Agarwal et al., 2018). In all cases, the diagnosis of echinococcosis was confirmed histologically and microbiologically.

Medical treatment

Current guidelines for the management of hepatic hydatid cyst indicate that surgery must be combined with adjuvant medical treatment with albendazole, which allows preoperative sterilization of the cyst and therefore a reduction in the risk of intraoperative dissemination. Some authors have suggested that postoperative albendazole treatment also allows a reduction of recurrences (Eroglua et al., 2009).

In the cases reviewed here, albendazole was used for preoperative sterilization and in the postoperative period for up to 6 months to prevent recurrence (Di Bello et al., 1964; Tetik et al., 2002; Darçin et al., 2003; Selcuk et al., 2008; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Sabzi and Faraji, 2014; Altaş et al., 2014; Salehi et al., 2015; Sahin et al., 2015; Parakh et al., 2016; Sağlıcan et al., 2016; Yaman et al., 2016; Fennira et al., 2019; Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018). The dose and duration of albendazole therapy was not reported in all of the articles. The most detailed protocol reported was albendazole at a dose of 400 mg twice daily at least 5 days before surgery and continued postoperatively for at least 12 weeks (Di Bello et al., 1964; Naeem et al., 2015; Altaş et al., 2014; Salehi et al., 2015; Agarwal et al., 2018).

Follow-up

Fortunately, cystectomy was associated with a high rate of complete recovery: 38 patients (84%) made a complete recovery.

Follow-up, where reported, ranged from 1 month to 3 years (Di Bello et al., 1964; Ernst et al., 1983; Cantoni et al., 1993; Jean et al., 1997; Maroto et al., 1998; Toquero et al., 2000; Tetik et al., 2002; Atilgan et al., 2002; Ilic et al., 2008; Eroglua et al., 2009; Mohsen et al., 2009; Bonardi et al., 2012; Ipek et al., 2011; Naeem et al., 2015; Sabzi and Faraji, 2013; Gocen et al., 2014; Sabzi and Faraji, 2014; Salehi et al., 2015; Parakh et al., 2016; Sağlıcan et al., 2016; Yaman et al., 2016; Fennira et al., 2019; Wadhawa et al., 2018; Alis and Turna, 2018; Agarwal et al., 2018). There was no follow-up data for the four patients who did not undergo surgery (Ozer et al., 2001; Darçin et al., 2003; Besir et al., 2013; Alis and Turna, 2018).

Conclusions

In conclusion, hydatid cyst of the heart and specifically the interventricular septum is rare. This review was performed to emphasize that cardiac hydatidosis should be considered in the differential diagnosis of patients who live in endemic regions presenting with unexplained cardiac symptoms. Echocardiography, CT, and MRI are useful in the diagnosis and location of cardiac echinococcosis. Treatment consisting of surgery with concurrent albendazole therapy typically yields excellent results. Early diagnosis of this condition is crucial to avoid serious complications.

Conflict of interest

The authors have no competing interests to declare.

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