Cardiac auscultation in the pneumopericardium

Cardiac auscultation is still an irreplaceable semiological tool in the physical examination of a patient, especially if he/she presents with atypical chest pain. "Mill wheel" murmur is the pathognomonic sign of pneumopericardium.

This is the case of a 44-year-old patient referred for persistent chest pain for the past 4 days, which appeared suddenly during the night while he was asleep and awakened him. The patient was referred with a presumptive diagnosis of gastritis/gastric ulcer and was medicated with proton pump inhibitors, with no effect on the chest pain. Physical examination draws attention to cardiac auscultation exquisitely located in fourth left intercostal space, midclavicular line, with a bubbling sound. When discussing it with the patient, he refers that he can feel it and that it began together with the pain. ECG showed no alterations. A chest X-ray was performed and pneumopericardium was diagnosed (Figure 1).

Pneumopericardium is defined as the presence of

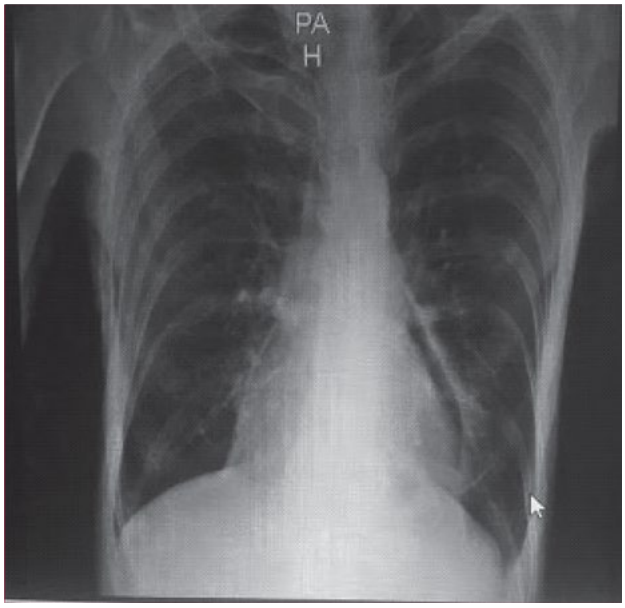

Fig. 1. Chest X-ray

air in the pericardial cavity; it is a very rare but potentially serious clinical entity, since it may cause cardiac tamponade.

Bricheteau first described pneumopericardium in 1844. He discovered a sign in a patient with hydropneumopericardium that since then has been considered as pathognomonic of this entity, the bruit de moulin, consisting of a fluctuating precordial sound, although it usually appears only in cases of complicated pneumopericardium. In 1931, Shackelford (1) proposed diagnostic criteria for pneumopericardium: "High-pitched tympanic percussion note, loud metallic splashing sound synchronous with heart sounds, and characteristic chest X-ray with an air-fluid level in the pericardial cavity"

The etiology of pneumopericardium is classified into two main groups: traumatic and non-traumatic. The causes of traumatic pneumopericardium are multiple and varied, with open or closed traumas presenting the highest incidence. The most representative non-traumatic pneumopericardium causes include severe asthma, esophageal ulcers, neoplasms, and spontaneous esophageal rupture. These patients usually present with penetrating chest pain and dyspnea, with pain radiating to the left shoulder due to pericardial irritation; in addition, they may have fever and shock. The electrocardiogram is nonspecific, as it may show changes consistent with atrial fibrillation, pericarditis or cardiac tamponade, but is usually normal in most patients.

The patient of the present case had a 2-year history of esophageal squamous cell carcinoma treated with radiation therapy; however, since September 2018 he had a persistent lesion at 40 cm from the upper dental arcade that did not allow the passage of the endoscope, and an esophageal dilation was attempted in December 2018.

Sometimes, the esophageal condition can affect the pericardium catastrophically, often with little or no prodrome, and with insidious and progressive onset, often causing diagnostic misinterpretations. The reverse rarely occurs, and calcific constrictive pericarditis can erode the esophageal wall. An interconsultation with the Departments of Cardiology and General Surgery was made on the course of action, and it was decided that treatment would be conservative provided no cardiac tamponade or decompensation occurred. Oral feeding was discontinued and replaced by gastrostomy with good tolerance. Due to fever and leukocytosis, and the risk of pneumopyopericardium, the patient was started on a 7-day course of piperacillin/tazobactam. The patient had a good clinical course, and four days after diagnosis, both the patient and the physician stopped perceiving the "mill wheel" murmur. Lab tests were normalized, and a new chest X-ray revealed clearance of the pericardial halo image

The condition was interpreted as an esophagopericardial fistula secondary to actinic lesion of esophageal cancer, or its progression with pericardial invasion.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material).

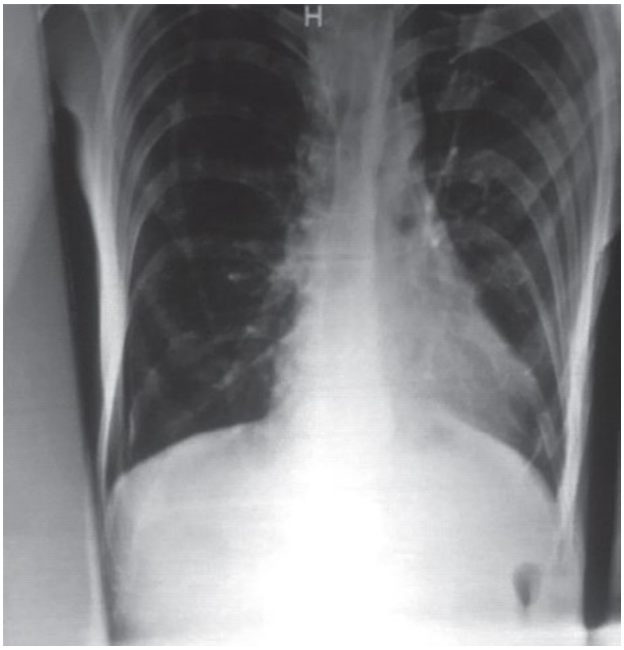

Fig. 2. Chest X-ray showing clearance of the pericardial halo image.

Daniela María Bianchi Pintos, Hugo Bergoglio, Juan José Dours, Mario Agarzúa, Carlos Vignau, Sebastián Polo
Hospital Municipal de Azul Dr. Ángel Pintos - Amado Diab 270, B7300 Azul, Buenos Aires
Dr. Mario Agarzúa – Email: cardiocemeda@gmail.com

Rev Argent Cardiol 2019;87:65-66. http://dx.doi.org/10.7775/rac.v88.i1.16382

REFERENCES

1. Fernández Isla LE, Fernández Ruíz JS. Neumopericardio en un paciente con carcinoma de pulmón. Semergen2017;43:463-5. https://doi.org/10.1016/j.semerg.2017.01.002
2. Ruano Poblador A, Gay Fernández AM, García Martínez MT, Galán Raposo L, Maruri I, Carracedo Iglesias R, et al. Rev EspEnferm Dig 2007;99:168-71.
3. Grubina R, Cha YM, Bell MR, Sinak LJ, Asirvatham SJ. Pneumopericardium Following Radiofrequency Ablation for Atrial Fibrillation: Insights into the Natural History of Atrial Esophageal Fistula Formation. J CardiovascElectrophysiol 2010;21;1046-9.https://doi.org/10.1111/j.1540-8167.2010.01740.x
4. Lages J, Oliveira CC, Lacerda C. Pneumopericardium due to bronchopericardial fistula in a patient with lung cancer. BMJ Case Rep 2018; pii:bcr-2018-226939. https://doi.org/10.1136/bcr-2018-226939
5. Imran Hamid U, Booth K, McManus K. Is the way to a man's heart through his stomach? Enteropericardial fistula: case series and literature review.Dis Esophagus 2013;26:457-64. https://doi.org/10.1111/j.1442-2050.2012.01373.x
6. Raman Mehrzad David H. Spodick, Pericardial involvement in diseases of the heart and other contiguous structures: part II: pericardial involvement in noncardiac contiguous disorders. Cardiology.2012;121:177-83. https://doi.org/10.1159/000337074

Survey of Pregnant Women with Serological Diagnosis of Chagas Disease and its Association with Neonates

Congenital Chagas disease is the vertical transmission of *Trypanosoma Cruzi* from mother to child that can occur during pregnancy or childbirth. Its incidence in Argentina is 7%, and positive diagnosis of Chagas disease in pregnancy is around 2%, according to statistics of pregnant women attended in our Obstetrics Service. Since the enactment of National Law No. 26,281 in 2007 on the prevention and control of Chagas disease, which requires all pregnant women to undergo serology for Chagas, the diagnosis of the disease in neonates has simultaneously increased. (1) Given that congenital Chagas disease corresponds to an acute stage of the disease in which the parasite is in the blood, there are medicines to cure it.

The purpose of this study was to analyze Chagas detection data in newborns for their treatment and healing, and in pregnant women to carry out secondary prevention in women of childbearing age.

A retrospective, descriptive, statistical analysis of mothers from the Obstetrics Service of Hospital Mi Pueblo in Florencio Varela, Buenos Aires, was carried out between 2013 and 2018. The total number of pregnant women was divided by year into the following groups based on the results of the Chagas test: positive, negative, not tested, and no data. In addition, the number of Chagas-positive neonates in relation to Chagas-positive mothers was collected through the Epidemiological Record of the Chagas Disease Control Program, belonging to the Argentine Chagas Network. (2) Indirect hemagglutination assay (IHA) and ELISA were the serological techniques used in adults, and the modified Strout method was used in neonates. (3) Strout's method consists of collecting three serial blood samples from the neonate in the first ten days of life: the first one from the umbilical cord, and the other two from peripheral blood with anticoagulant as the volume collected is small. After blood sedimentation, different layers are found in the test tube: an upper layer of plasma, an intermediate thin layer of white blood cells, and a bottom layer of red blood cells. The intermediate layer shows the Trypanosoma Cruzi, since it has the same specific weight as white blood cells. Patients who are negative to the modified Strout method are diagnosed again eight months later with the usual serological reactions.

Table 1 summarizes findings in pregnant women and neonates based on the results of the Chagas test. The percentage of Chagas-positive mothers out of the total number of pregnant women was 1.14% throughout the period, and varied between 0.82% and 1.56% depending on the year considered. The percentage of mothers not tested for Chagas disease out of the total number of pregnant women varied between 13.5% and 24.1% depending on the year considered. Five cases

Table 1. Statistical summary of pregnant women and neonates based on the results of the Chagas test.

YEAR	Total number of mothers	Positive for Chagas	Negative for Chagas	Not tested for Chagas	No data	Chagas-positive neonates
2013	4,479	70 (1.6%)	3434 (76.7%)	879 (19.6%)	96 (2.2%)	1 (1.4%)
2014	5,587	46 (0.8%)	4029 (72.1%)	1405 (24.1%)	107 (1.9%)	1 (2.2%)
2015	5,737	70 (1.2%)	4634 (80.8%)	994 (17.3%)	39 (0.7%)	1 (1.4%)
2016	5,245	54 (1.0%)	4440 (84.7%)	708 (13.5%)	43 (0.8%)	1 (1.9%) *
2017	5,207	63 (1.2%)	4395 (84.4%)	734 (14.1%)	15 (0.3%)	0 (0.0%)
2018	5,202	55 (1.1%)	4369 (84.0%)	755 (14.5%)	3 (0.1%)	1 (0.1%) †

*Chagas was detected at 8 months of age, and † at one year of age.

of congenital Chagas disease were diagnosed between 2013 and 2018, representing an incidence of 0.02% for the whole period over the total number of pregnancies (n: 31,457), and of 1.4% over the total Chagas-positive pregnant women (n: 358). Three cases were diagnosed with the modified Strout method and two with serological reactions. The treatment in neonates was carried out with benznidazole in the Department of Neonatology, and patients were followed-up until the treatment was completed. Treatment efficacy was verified by negative test reactions and normal cardiac tests.

Limitations include the fact that some patients did not return to the hospital for the second and third post-discharge follow-ups. Furthermore, neonates born on Saturdays and Sundays were not tested for Chagas with the modified Strout method.

In conclusion, this series of more than 30,000 pregnancies –most of them controlled for Chagas disease reactivity– allowed to calculate the incidence of congenital Chagas over a 6-year period in a public hospital of the Province of Buenos Aires. This sample showed a decrease in the percentage of women not tested for Chagas disease from 19.6% in 2013 to 14.5% in 2018. However, the incidence of Chagas-positive mothers will vary according to the epidemiology of the disease in each zone or province. In our case, the National Law No. 26,281 provided the tools for the diagnosis, treatment, prevention, and control of this disease.

We thank Julieta Torres, resident in Obstetrics, and the Obstetrics Service for data collection. We also thank the Nursery team of Hospital Mi Pueblo for the treatment of neonates.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/ Supplementary material).

Regina E. Albarez, Marcelo D. Benassi, Mónica Gili, Marisa López, Jorge Arbizu
Dr. Salvador Mazza Chagas Disease Council of the Argentine Society of Cardiology and Hospital Mi Pueblo, Florencio Varela, Buenos Aires Argentina
Regina E. Albarez: Cardenal Cagliero 204, Bernal, Buenos Aires, Argentina (B1876BXD) reginaestelaalbarez89@gmail.com

Rev Argent Cardiol 2019;87:66-67. http://dx.doi.org/10.7775/rac.v88.i1.16382

REFERENCES

1. Ley Nº 26281, Prevención y control de todas las formas de transmisión de la enfermedad de Chagas. Boletín Oficial, Buenos Aires, Argentina, 5 de septiembre de 2007.
2. Historia clínica del paciente infectado por T. cruzi con tratamiento tripanocida. Programa Nacional de Chagas. Guías para la atención al paciente Infectado con (Trypanosoma Cruzi), Enfermedad de Chagas. 2ª ed. Buenos Aires: Ministerio de Salud de la Nación; 2012. p. 51-55.
3. López M. Técnica de Strout Modificado en recién nacidos para la detección del Trypanosoma Cruzi. Observaciones no publicadas.