Journal of Advances in Medicine and Medical Research

32(8): 119-124, 2020; Article no.JAMMR.57695
ISSN: 2456-8899
(Past name: British Journal of Medicine and Medical Research, Past ISSN: 2231-0614, NLM ID: 101570965)

Isolated Spleen Metastasis from Lung Adenocarcinoma: A Case Report

Burcu Oz[1], Nilsu Renklitepe[1], Serkan Celik[1] and Bala Basak Oven[1*]

[1]Bahcesehir University Medical Faculty, Department of Medical Oncology, Istanbul, Turkey.

Authors' contributions

This work was carried out in collaboration among all authors. Author BBO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors BO and NR managed the analyses of the study. Author SC managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2020/v32i830471
Editor(s):
(1) Dr. Rameshwari Thakur, Muzaffarnagar Medical College, India.
Reviewers:
(1) Nupur Gupta, Institute of Dental Sciences, India.
(2) Neelam Tejani, Deemed To Be University Karad, India.
(3) P. M. Suneesh, Saurashtra University, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/57695

Case Report

Received 05 April 2020
Accepted 11 June 2020
Published 16 June 2020

ABSTRACT

Solitary splenic metastasis is extremely rare with few reported cases in literature. Current study reports the case of a 74-year-old, female patient who was diagnosed isolated spleen metastasis after lung adenocarcinoma, in the postoperative course. She presented with the incidental detection of nodular liver and central splenic lesions in a follow-up abdominal computed tomography (CT) scan after 5 years from the left lower lobectomy due to lung adenocarcinoma. By MRI examination, lesion in the liver was characterized as cystic and the central splenic lesion was found having a heterogeneous hypoechoic nodular character. Tru-cutbiopsy of spleen confirmed metastasis of lung adenocarcinoma. The patient underwent splenectomy. Although liver biopsy couldn't detect any malignant tissue, lung cancer adenocarcinoma metastasis was diagnosed in splenectomy material. Herein, we report a case of incidentally found solitary splenic metastasis, 5 years after left lobectomy for lung adenocarcinoma.

Keywords: Spleen; isolatedmetastasis; lungcancer.

**Corresponding author: E-mail: basakoven@yahoo.com;*

1. INTRODUCTION

Splenic metastasis is rare and spleen is mostly involved as a part of diffuse carcinomatosis usually indicating advanced stage with widespread tumor dissemination in multiple organs [1-3]. Primary cancers are mostly:breast, colorectal and ovarian carcinoma and melanoma. Only 0.96% of metastatic carcinomas and 2.9–4.4% of autopsied carcinoma specimens are found to be splenic metastasis from non-hematologic malignancies [4]. Cai Q et al. also supported that, it is unlikely for non-hematopoietic cancers such as primary lung cancer to metastasize to spleen [3]. Thus, isolated splenic metastasis from lung cancer is considered to be even rarer and is usually detected at autopsy, although numerous cases of abdominal visceral metastases from lung cancer have been reported [5]. We report a case of isolated splenic metastasis in a woman 5 years after lobectomy for an adenocarcinoma in the left lung lobe resected.

2. CASE REPORT

A 74-year-old woman presented with the incidental detection of 4 cm in diameter, hypodense, space-occupy inglesion in *spleen* during a follow-up abdominal computed tomography (CT) scan. Additionally, nodular formations were observed in the left liver lobe lateral segment with a 20 mm long axis and in the right lobe large stone being 15 mm. The hypodense lesion with 20 mm diameter in the liver did not show FDG uptake in the PET-CT. In the subsequent abdominal MRI with contrast, hepatic lesions raised a suspicion of metastasis was reported as hepatic cyst. Also one heterogeneous hypoechoic nodular lesion (31x32 mm) located centrally on spleen was detected.

At the age of 69 years, the patient had undergone left lower lobectomy due to lung adenocarcinoma. Since it was early stage (T1BN0M0), she had been routinely controlled without adjuvant therapy. The physical examination was unremarkable. Splenic and hepatic lesions were suspected as metastases of primary lung adenocarcinoma. Although hepatic lesions which were suspected as malignant were detected as benign cystic lesions in following abdominal USG imaging, hypoechoic splenic mass in parenchyma (30x17 mm) was interpreted as metastasis after abdominal MRI detected solid, and contrast-enhanced mass

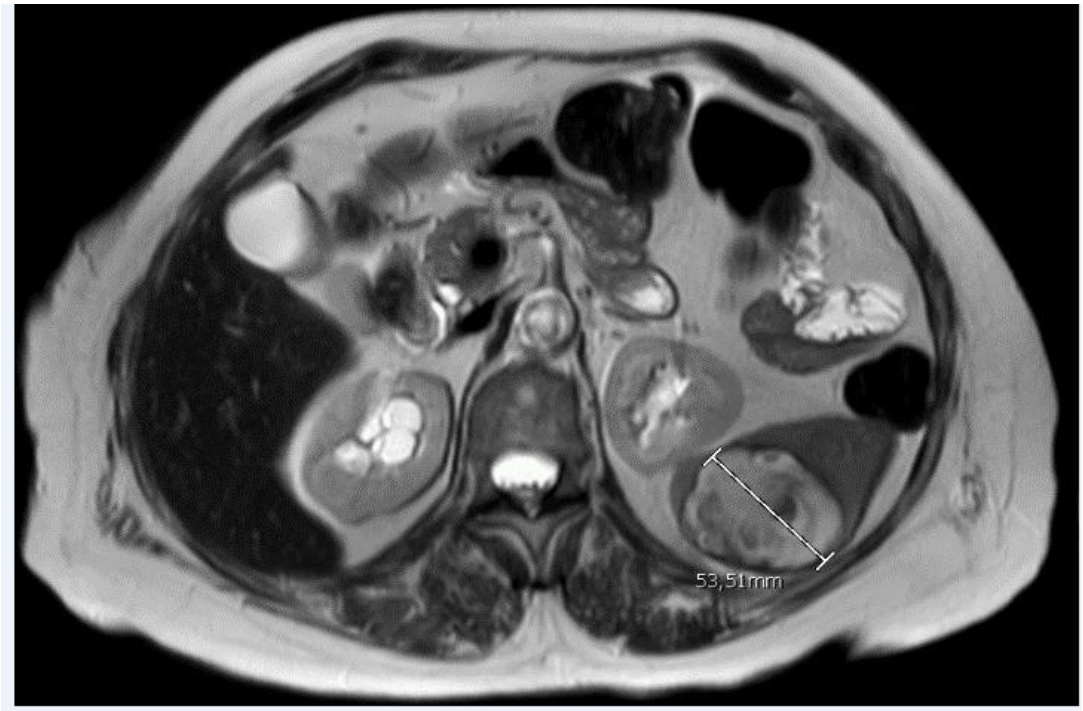

Fig. 1. Follow-up upper abdominal MRI revealed a cystic lesion in the spleen that measured 53.51 mm surrounded by hypointense fibrous capsule

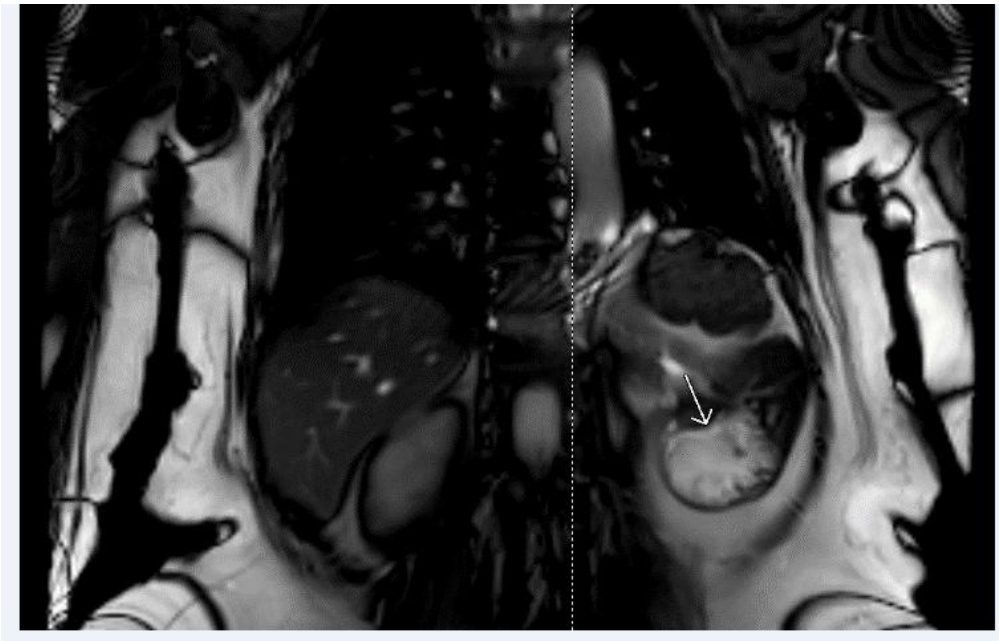

Fig. 2. Hyperintense cystic formation in spleen, in coronalplane (arrows)

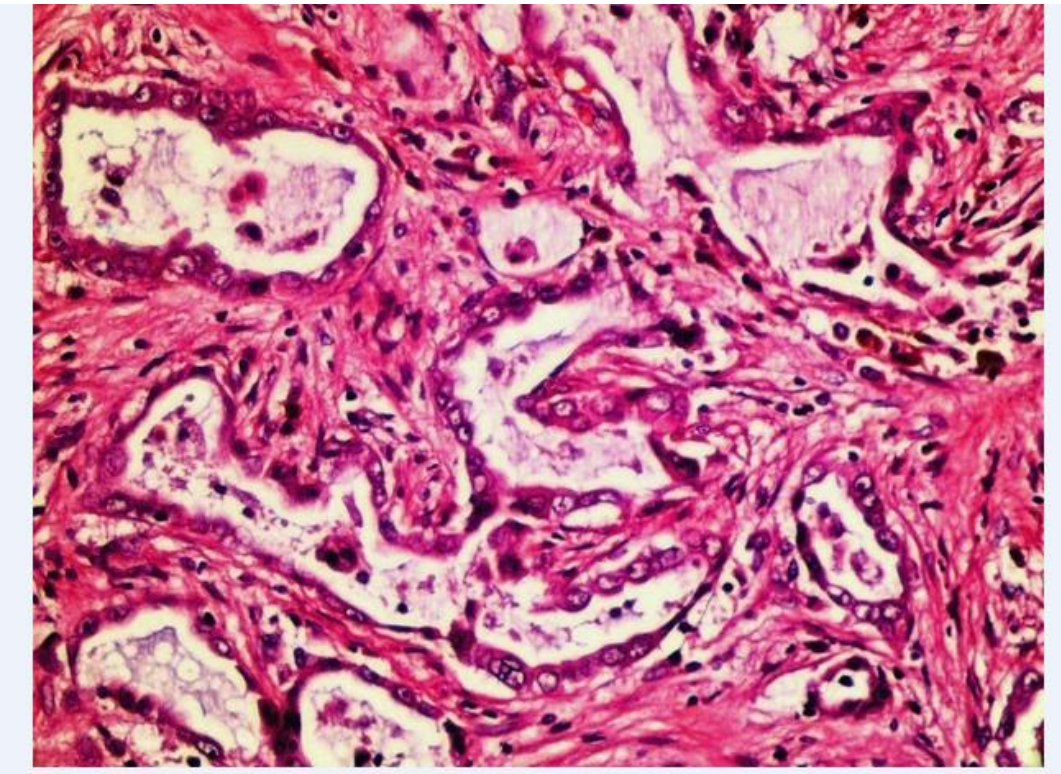

Fig. 3. Resected spleen tumor (hematoxylin and eosin staining x200)

supported metastasis. In order to detect the character of splenic lesion precisely, a tru-cut biopsy was performed. The result was concordant with metastasis of lung

adenocarcinoma (CK7+, CK20-, TTF1+, ki67 1%). In genetic analysis, ROS1, EGFR, EML4/ALK mutations and PDL-1 expression were not detected. She was given 3 courses of carboplatin-paclitaxel as preoperative therapy. According to the upper abdomen MRI following the last chemotherapy course, there were reported multiple benign cysts, the biggest of diameter 2.5 cm, in liver and a 53.51 mm cystic lesion with a T1 and T2 hypointense fibrous capsule in the spleen (Figs. 1, 2). The patient underwent splenectomy. Specimens taken from the liver and the resected spleen was pathologically examined. Although the spleen material wasfound to be metastases of lung adenocarcinoma, there was no tumor tissue found in liver biopsy. It was concluded that this was an *isolated spleen metastasis of lung adenocarcinoma* (Fig. 3).

3. DISCUSSION

In a meta-analysis of 713 patients with spleni cmetastases; metastasis was found to be originated from 23% breast cancer, 20% lung, 9% colon/rectum, 9% ovarian [2]. The highest risk for metastasis to the spleen is malignant melanoma with a rate of 30%, whereas only 5.6% was reported in lung cancers [6]. Koca H et al. stated that isolated spleen metastasis accounts for 2.3-7.1% in all solid carcinomas [7,8]. At autopsy Lam KY et al. noted that isolated splenic metastases were found in 5.3% of splenic metastases, primary tumors being in lung, liver and pancreas [2]. When splenic masses and nodules are detected; hemangioma, hamartoma, inflammatory pseudotumor, non-Hodgkin lymphoma and Hodgkin's disease; granulomatous diseases such as sarcoidosis, tuberculosis and histoplasmosis, should be considered in differential diagnosis along with metastasis. It is well known that the spleen is much more protected against metastases due to anatomical, physiological and lymphoid features compared to the organs [9,10]. Splenic capsule, constant blood flow, rhythmic contractility, sharpspins of the spleen artery, high immune cell count and high angiogenesis inhibitory factor levels complicate tumor embolism to reach the spleen [11]. As Hara K et al. Reported that splenic metastasis from the lung cancer was 7 times more common among males compared to females and the mean age was 63 years. Most of the patients were asymptomatic and showed metachronous metastasis rather than synchronous. Mean size of splenic metastasis was also reported as 7 cm. After examining all 27 case still 2017, Hara K et al. demonstrated that the five-year survival rate as 41% and indicated that pathologic lymph node stage N1–3 cancer, tumor rupture, and synchronous disease were found to be poor prognosticf actors [12]. In our case the isolated spleen metastasis was deteceted metachronously after 5 year from the diagnosis of stage I lung cancer. Symptomatic cases make up only the 8% in isolated spleen metastasis [2]. Symptomatic patients are mostly young and female, suffering from pain and splenomegaly. Symptoms associated with hypersplenism such as; fatigue, weight loss, fever, abdominal pain, splenomegaly, anemia or thrombocytopenia, and less commonly splenic rupture can be seen. What makes early detection of metastasis to the spleen difficult is that they are mostly asymptomatic. Inconsequence, spleen metastasis is generally detected incidentally during a routine follow-up, which is the case for our patient as well. In a 25 year clinicopathologic study, it was stated that in majority of cases, spleen metastasis was seen approximately 6-7 months after primary tumor detection, whereas in 15% this latency period exceeds 2 years [2]. Inourcase, spleen metastasis was detected after 5 years from left lower lobectomy, which is a longer period rather than expected. We think that because of low ki67 (%1) rate of tumor, metastasis were detected after long follow-up.

Accordingto Mitsimponasa et al. half of the lung cancers are metastatic at diagnosis [13]. Relying on current data, the majority of the primary tumors of splenic metastasis are histologically adenocarcinoma [14]. Primary lung tumor that metastases to spleen is more commonly located on the left lung, as well as in ourcase, depending on the excess of rate of blood flow compared to the right [6,10,15].

Growingnumber of splenic metastases from various solid tumor types have been identified, owing to medical imaging techniques. CT scanning and ultrasonography are prefered, in terms of quick, direct and non-invasive evaluation of spleen metastasis. However, ultrasonography does not always yield clear images, as a result of air in the stomach and colon [10]. Thus, CT scan of abdomen is regarded as the gold standard for splenic metastasis [11]. There were several reports that highlighted the clinical significance of FDG-PET/CT scanning in the detection of spleen metastasis from lung cancer [16]. Furthermore, splenectomy or an ultrasonically-guided fine-

needle aspiration biopsy are diagnostic tools with high success ratio and negligible complication rate [17]. Because of no FDG uptake of splenic lesion in the PET-CT in our case, the spleen mass biopsy was performed in the light of MRI findings. Since lung cancer rarely metastasize to spleen, splenectomy is not discussed as a therapeutic strategy in the guidelines. But if therapeutic principle of solitary brain or adrenal metastasis is followed, splenectomy is regarded as a good option for solitary splenic metastasis [12] Also Lee et al. Recommended splenectomy, since most splenic metastases were located within the parenchyma, as a result of hematogenous spread [15]. According to some reported cases where splenic metastases occurred lately, which were assumed to be a result of early blood-borne micrometastasis, only splenectomy was found to be effective in long term remission [11]. In oligometastatic cases, splenectomy was applied in the purpose of prolonging survival, protecting adjacent organs from metastasis, preventing complications such as pain, rupture, splenic vein thrombosis [18]. Only a few data areavailable on recurrence of metastases after splenectomy [19]. As spleen metastasis is mostly indicative of advanced stage, in patients with lung cancer with isolated splenic metastasis, life expectancy after splenectomy is 1 to 49 months, although there are a few cases that survival prolonged up to 8 years [3]. In addition to splenectomy, systemic chemotherapy (adjuvant or neoadjuvant) is the preferred treatment. Consensually, neoadjuvant therapy followed by splenectomy was given to our patient.

Here in we report a case of isolated splenic metastasis in a woman 5 years after lobectomy for lung adenocarcinoma. It can be concluded that, in a patient with a history of primary early stage lung cancer it is still possible for metastasis to ocur to rare sites, such as spleen, evenafter a long period of time has passed from lobectomy. Improvements in imaging techniques, facilitate increased detection of splenic metastasis even if the patient is asymptomatic.

4. CONCLUSION

So the long time radiological follow-up is important for lung cancer especially for low grade tumor because of late recurrence. It should keep on mind the metastasis from the primary lung cancer if new lesions were detected in the spleen during follow-up. Splenectomy with systemic chemotherapy is the preferred choice of treatment in such cases.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gemignani ML, Chi DS, Gurin CC, Curtin JP, Barakat RR. Splenectomy in recurrent epithelial ovarian cancer. Gynecol Oncol. 1999;72:407–10.
2. Lam KY, Tang V. Metastatic tumors to thespleen: A 25-year clinicopathologic study. Arch Patho lLab Med. 2000;124:526–30.
3. Cai Q, Kragel P. Isolated splenic metastasis in a patient with lung carcinoma: Case report and review of the literature. J Clin Exp Pathol. 2015;5:252.
4. Nash DA Jr, Sampson CC. Secondary carcinoma of the spleen: Its incidence in 544 cases and a review of the literature. J Natl Med Assoc. 1966;58:42–6.
5. Iguchi K, et al. Spleen metastasis from lung cancer. Experimental and Therapeutic Medicine. 2015;10:733-36.
6. Kinoshita A, et al. Splenic metastasis from lung cancer. Neth J Med. 1995;47:219-23.
7. Berge T. Splenic metastases: Frequencies and patterns. Acta Pathol Microbiol Scand A. 1974;82:499–506.
8. Koca H, et al. Lung adenocarcinoma diagnosed by isolated spleen metastasis: Case report. Causa Pedia. 2019;8:15-18.
9. Marymont JH, Gross S. Patterns of metastatic cancer in the spleen. Am J Clin Pathol. 1963;40:58-66.
10. Kızılgöz D, et al. Splenic metastasis in lung cancer. Turkiye Klinikleri Arch Lung. 2017;18:47-51.
11. Comperat E, et al. Splenic metastases: Clinicopathologic presentation, differential diagnosis, and pathogenesis. Arch Pathol Lab Med. 2007;131:965-9.
12. Hara K, et al. Solitary splenic metastasis from LAC: A case report. Thoracic Cancer. 2017;8:539–42.

13. Nikolaos M, Maria M, Felipe C, Karl-Axel H, Stefan D, Bernd K, Aristoteles G. Isolated splenic metastasis from non-small-cell lung cancer: A case report and review of the literature. Case Rep Oncol. 2017;10:638-43.
14. Agha-Mohmadi S, Calne RY. Solitary splenic metastasis. Case report and review of literature. Am J Clin Oncol. 2001;24:306–10.
15. Lee SS, Morgenstern L, Phillips EH, Hiatt JR, Margulies DR. Splenectomy for splenic metastases: A changing clinical spectrum. Am Surg. 2000;66:837-40.
16. Sardenberg RA, Pinto C, Bueno CA, Younes RN. Non-small cell lung cancer stage IV long-term survival with isolated spleen metastasis. Ann Thorac Surg. 2013;95:1432-34.
17. Keogan MT, Freed KS, Paulson EK,Nelson RC, Dodd LG. Imaging guided percutaneous biopsy of focal splenic lesions: Update on safety and effectiveness. AJR Am J Roentgenol. 1999;172:933–7.
18. Klein B, Stein M, Kuten A, et al. Splenomegaly and solitary spleen metastasis in solid tumors. Cancer. 1987;60:100-102.
19. Downey RJ, Ng KK, Kris MG, et al. A phase II trial of chemotherapy and surgery for non-small cell lung cancer patients with a synchronous solitary metastasis. Lung Cancer. 2002;38:193–97.

© 2020 Oz et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/57695