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Primary Mediastinal Lymphoma; the trend of incidence has turned toward the adults!

Abdolhadi Jahanshahi [1], Seyed Mansour Alamshah[2*]

[1]Associate Professor of Thoracic Surgery, Imam Khomeini Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
[2]Associate Professor of General and Vascular Surgery, Golestan Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Corresponding author: Seyed Mansour Alamshah, Department of General and Vascular Surgery, Golestan Hospital, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran. Tel & fax: +98-6113743076, +98-6113738468, E-mail: mansourseyedalam@yahoo.com

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Abstract

Background: Thymoma, lymphoma and neurogenic tumors are accounted as common mediastinal masses. They are more common in youngsters and middle ages. Although, lymphoma is proved to be more common in children, in recent years in our territory, adult cases were more dominant in referrals than previous.

Materials and methods: This retrospective review of incidence and pathologic types were performed during last seven years since May 2004. All the patients with mediastinal mass (MM) were admitted in the study with characters of age, sex, clinical manifestations, chest radiography and CT scanning and biopsy for histological results.

Result: A total number of 97 patients, with mediastinal involvement by primary masses, were contributed in this study. Biopsy was taken through the several ways. The numbers of 52(53.60%) "Lymphoma" and 45 (46.40%) cases with other pathologic results were dominantly detected with "tuberculosis". Two cases of lymphoma was found in two referred cases with MMs <10 years and the overall incidence of involvement was begun from first to fifth dec- ades with the peak in third to fourth decades along with mostly anterior mediastinal locations.

Conclusion: Conclusively most of MMs were located in the anterior mediastinum and about more than half of them were lymphoma as the most common malignant histological result. Since, preference of adult involvement was sta- tistically approved, we presumed that incidence of involvement is being turn towards adults in our territory and believe that it has been affected by some effective external factors such as mediastinal tuberculosis which was the second most mediastinal pathology.

Keywords: Lymphoma incidence; mediastinal masses; anterior mediastin tuberculosis

Background

Mediastinal masses (MM) are presented in de- fined anatomic locations of mediastinal sections related to the primary tissue sources. These mass- es are divided to inflammatory, cystic and tumoral types. Usually, thymomas, lymphomas and germ cell tumors are located in anterior mediastinum, bronchogenic cysts and lymphomas in the middle mediastinum and neurogenic tumors with sarco- mas in posterior mediastinum (1-3). The most common tumor of anterior mediastinum in chil- dren is lymphoma with the second germ cell tu- mors (4) and the most common masses in posteri- or mediastinum are neurogenic tumors (1, 2 and 4); whereas, thymoma then lymphoma and neuro- genic tumors have histopathologically been shown to be the most common in general (3, 5). The MMs can be formed in all ages however they are usually seen in youngsters and middle ages (3-4th dec- ades) (5). Their incidence may vary in all range of age from 20 days to about 80 years old (5, 6). Alt- hough, MMs especially most of the benign types may often be asymptomatic in over one quarter of cases (7, 8), but based on the literature, malignant tumors are always symptomatic (1). The most fre- quent clinical presentations are usually seen in two third of children and one third of adults (1). Persistent cough, fever, dyspnea, horseness, ca- chexia, upper neck and face static hyperemia and prominent neck veins with myasthenia can be pre- sented by MMs (1). "Critical mediastinal mass syn- drome", an entity of cardio-respiratory compres- sion, produced by tumoral involvement in anterior mediastinum with confirmed histology of neuro- genic masses as the most common etiology and secondly lymphoma in biopsy from mostly supe- rior mediastinal location in children concomitant with SVC syndrome can be critical and fatal (8). Basically, these masses may be found in all chest radiograms and/or sometime during ordinary ra- diography or CT scanning investigations in an asymptomatic patient based on their size (7). Since mediastinal tumors diagnosis depends on their presenting site and behaviors, simple chest X ray followed by CT scanning or MRI are essential because operability and probable vascular inva- sions also can be diagnosed (9,10). Laboratory in- vestigation for gonadotropin hormones is also crucial for any suspicion for differentiating germ cell tumors (1, 11). PET scan, octerotid and sesta- mibi scanning remains for ruling out the other benign differential diagnosis such as hyperplasia or parathyroid masses. Thoracoscopy, mediasti- noscopy and open procedures are the late and terminal investigation methods for diagnosis; be- cause, tissue sampling can be done by minor in- terventions like CT or MRI guided needle biopsies

(1, 11); though, lymphoma may be exempted be- cause of large tissue necessity for sampling and should be in combination with clinical and radio- logical information and ancillary investigations including immunohistochemical staining and/or gene study (12). The MMs treatment is surgery except for lymphoma and germ cell tumors in which the main way is chemo-radio therapy. If there be any residue, then surgery is indicated in its surgical manner (13). Since, it has been shown and proved that children are the most involved targets of lymphoma and it was presumed that our admitted referral young and middle age pa- tients were more involved by lymphomas, the study of its incidence along with mediastinal tu- mors were taken into consideration.

Materials and Methods

All patients with MM who referred for their dis- ease were contributed in this study as a retrospec- tive review of their tumoral pathology and inci- dence of involvement from the point of their age accompanied by other information need to be used. The study was performed in Ahwaz Jun- dishapour University of Medical Science affiliated
hospitals, Ahwaz-Iran, from February 2004 until
the end of January 2011 for the duration of seven years. Retro-sternal goiters and patients who were referred as general lymphoma cases from oncolo- gy department accompanied secondary mediasti- nal involvement have been omitted. Age, gender, clinical presentations, chest X ray, CT scanning, way of taking the specimen for pathology and mi- croscopic results were considered. The performed access to MMs was obtained on the basis of the site and tumor accessibility. The applied accessi- bilities were anterior MM through the anterior mediastinotomy, middle MM from thoracotomy, mediastinal-neck masses from the neck and pos- terior MM by CT or MRI guided needle biopsy. Most of the biopsies were performed by the ante- rior sternotomy, through "Chamberlain incision" with preservation of ipsilateral internal mammary artery.

Results

A total number of 97 cases were selected with MMs involvement from which 48 (49.48%) cases were male and 49(50.51%) cases female. Directions of location were: 50 (51.54%) right, 33 (34.02%) left and 14 (14.43%) bilateral. In total seventy four (76.38%) cases were found in anterior mediasti- num, fifteen (15.46%) cases in middle mediasti- num and eight (8.29%) in posterior mediastinum. Presented clinical symptoms (Table 1) were seen in 71 (73.33%) of all patients and 26 (26.67%) were asymptomatic in whom MM was diagnosed as in- cidental finding. Cough and dyspnea (34.02), fever and cough (21.64%) and SVC obstruction (10.30%) were the most common clinical presentations. An- terior mediastinotomy (63.91%) and lateral thora- cotomy (17.59%) were the most common per- formed procedures in our cases (Table 2). Micro- scopic findings were shown in (Table 3). Of 52 accurate pathological results. It has been suggest- ed that core needle biopsy of mediastinal tumors cases with lymphoma, 25 cases (9 male, 16 female)
were Hodjkin,s type and 27 (18 male, 9 female) were non-Hodjkin,s lymphoma. Tuberculosis was the 2nd most common finding after lymphoma. Age distribution was shown in table 4. The peak age of involvement for entire MMs and also Lym- phomas were between third and fourth decades of their age; whereas, for other non-lymphoma type MMs were between second to third plus fifth to sixth decades of their age. The age involvement in children was 100%, two lymphomas that were found from two cases of referral MMs in first dec- ade of their life and for the peak age of lymphoma in young and middle ages, in second to fourth decades (20-40y). Overall duration of lymphoma prevalence was from first to fifth decades. For biopsy and resections there was no mortality from above techniques. Of the 97 cases of MMs, 64 (65.97%) contained malignant tumors and 33 (34.02%) were benign masses. The most common microscopic report for malignancies was found to be lymphoma and for benign lesions was tubercu- losis.

Table 1. Clinical presentations

Sign & symptom	No (%)
Cough and Dyspnea	33(34.02 %)
SVC obstructions	10(10.30 %)
Fever and cough	19(21.64 %)
Hoarseness	2(2.06 %)
Chest pain	4(4.12 %)
Myasthenia	1(1.03 %)
Asymptomatic	26(26.80 %)

Table 2. Tissue sampling procedures

Operation	No (%)
Medistinotomy	62(63.91 %)
Lateral thoracotomy	17(17.52 %)
Sternotomy	3(3.09 %)
Neck procedures	6(6.18 %)
CT. MRI guided needle biopsy	9(9.28 %)

Table 3. Types of pathology

Pathology	No (%)
Lymphoma	52(53.60%)
Tuberculosis	11(11.34%)
Normal lymphatic tissue	6(6.18%)
Benign masses	11(11.34%)
Lung cancers	8(8.25%)
Round cell tumors	4(4.12%)
Sarcoidosis	2(2.06%)
Thymoma	3(3.09%)

Discussion

Mediastinal lymphoma, an anterior located tu- mor that may usually presented in a wide range of age has been mostly introduced in the literature with children propensity. It accounts the most common tumoral anterior mediastinum presenta- tion in children. Almost all pediatric lymphomas are malignant high grade tumors. The combined

incidence of Hodgkin's and non-Hodgkin's lym- phomas reaches 10 to 12 cases annually per million children under the age of 16 years. Further- more, it includes 10% of all pediatric cancers (14).

Table 4. Age expansions based on number of patients and pathology

Range of ages (year)	0-10	11-20	21-30	31-40	41-50	51-60	61–70	71-80	81-90	Total No %
Patients (97) No %	2 (2.06%)	15 (15.46%)	36 (35.05%)	17 (17.52%)	7 (7.21%)	12 (12.37%)	8 (8.24%)	2 (2.06%)	0 0%	97 (100%)
Lymphomas No %	2 (3.84%)	10 (19.23%)	23 (44.23%)	12 (23.07%)	3 (5.76%)	0	2 (3.84%) %	0	0 0	52 (100%)
Non-lymphomas No %	0	5 (11.11%)	11 (24.44%)	5 (11.11%)	4 (8.88%)	12 (26.66%)	6 (13.33%)	2 (4.44%) %	0 0	45 (100%)
Range of ages (year)	0-10	11-20	21-30	31-40	41-50	51-60	61–70	71-80	81-90	Total No %
Patients (97) No %	2 (2.06%)	15 (15.46%)	36 (35.05%)	17 (17.52%)	7 (7.21%)	12 (12.37%)	8 (8.24%)	2 (2.06%) %	0 0	97 (100%)
Lymphomas No %	2 (3.84%)	10 (19.23%)	23 (44.23%)	12 (23.07%)	3 (5.76%)	0	2 (3.84%) %	0	0 0	52 (100%)
Non-lymphomas No %	0	5 (11.11%)	11 (24.44%)	5 (11.11%)	4 (8.88%)	12 (26.66%)	6 (13.33%)	2	0 %) 0 %	45 (100%)

Adult involvement is seen in the young and middle ages (1). The peak duration of incidence for presentation in this study was shown in third and forth decades of life between 20- 40 years old group with less involvement in first decade and children. Although, the involvement in children was 100% in the present study (Table IV), it could not be statistically worthy as an acceptable high incidence in this group of patients. According to the gender, it was not found any considerable preference between male and female (48 male ver- sus 49 female). In some study the preference of male to female have been shown (5, 6). Moreover, many studies have confirmed the high prevalence of mediastinal masses in anterior and superior locations (5, 6, 8 and 15). They did not compare the direction of tumor progression or location along the right or left side in mediastinum. In this study, MMs were found more common in right side and anterior mediastinum presented with cough as the most common symptom between clinical presentations that usually was accompa- nied by fever and dyspnea. It was interesting that about one quarter of incidentally diagnosed pa- tients were asymptomatic which was consistent with the other studies (7, 8). In addition, lympho- ma was known as the most common mass of me- diastinum overall in our cases with tuberculosis as the second. This finding was not in parallel to other studies because it is now expected and ad- vocated that despite the rarity in children, Thy- momas especially malignant types are totally more common in medistinum (5, 7 and 16). There- fore, popularity of lymphoma and tuberculosis that are usually seen in immune deficient patients may raise the issue of possible existence of some interfering or predisposing factors which have induced the occurrence of lymphoma as a compli- cation and the most dominant malignancy in pa- tients between their third and forth decades of life presenting with MMs in our contaminated territo- ry by previous imposed chemical war. Based on the location of MMs and lymphoma prevalence, and acceptance the fact that needle biopsy and/or even mediastinoscopical biopsy are not always sufficient and suitable for sampling to confirm prompt microscopic diagnosis of lymphomas (17), mediastinotomy through the Chamberlain incision was the most successful approach had been used for sampling and resections in our cases because of direct accessibility, simplicity of procedure, comfortable position (supine), the least pulmonary changes during anesthesia, necessity of sufficient tissue biopsy and shortening post operation han- dling. There was no any mortality or even morbid- ity with using this approach. Similar studies also advocated surgery through the mediastinum, sternum or thorax as the preferred ways for diag- nostic and therapeutic approach depending on tumoral locations and size especially in existence of complications like SVCS, vascular invasions, respiratory compressing syndrome, residual tu- mor and recurrence; though, in emergency situa- tions induction chemotherapy was confirmed to be more efficacious and indicated (3, 6, 7, 15, 18 and 19).

Conclusion

We believe that all patients mostly between 20 - 40 years old who present with coughing, fever or dyspnea and MM, are involved dominantly by lymphoma as its demo- graphic feature for the incidence, might be changed toward the adults probably by unknown external interfering factors especially in our terri- tory. These patients should be investigated by contrast supported CT scanning and ultimate bi- opsy or confined excision preferably through me- diastinotomy for bulky sufficient samples depend- ing on size and location. Other minor invasive ap- proaches are time consuming and are not cost- effective.

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Conflict of Interest

There is no conflict of interest to be declared.

Authors' contributions

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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