Skeletal Metastasis;Distribution by Age, ,Sex,and Histological Classification(Medical city)

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ABSTRACT:

BACKGROUND:

Skeleton is the one of the commonest sites of secondary cancer, it is seen more frequently than all primary bone tumors together. Vertebrae, pelvis and proximal parts of long bone are more involved by secondary metastasis. Breast cancer is the commonest cause of primary tumor followed by Prostatic carcinoma. Despite the advances in diagnosis but still about 10 % of cases remain as secondary with undetermined primary site.

OBJECTIVE:

To disclose the distribution of bone metastasis and their primary site among Iraqi patients.

PATIENTS AND METHOD:

102 patient were enrolled in a retrospective study conducted in medical city complex in Baghdad/ Iraq from January 1990- July 2000.

Patient are either known to have primary malignant tumor and discovered to have secondary metastasis to bone as part of the routine screen or development of symptoms suggestive of bone metastasis, the other group of patients are presented with bone metastasis. All patients are subjected to intensive medical history and proved their secondary metastasis by excisional biopsy or fine needle aspiration with histopathological diagnosis

RESULTS:

The mean age of our patients was 41 years, with range (2-80 years), men were commonly involved than women, the peak incidence of metastasis was in 1991. Vertebral bodies are commonly involved and lungs are the most common primary site

CONCLUSION:

Well differentiated columnar adenocarcinoma is the commonest histopathological type of malignant tumor metastases to bones, lungs are the most common primary site. Undetermined primary tumors are still consist a diagnostic problem in our daily practice more cooperative team work is needed to disclose the final diagnosis

KEY WORDS: bone metastasis, adenocarcinoma, osteolytic.

INTRODUCTION:

Metastases is one of the most serious and deadly aspects of cancer and affects two-third of patients [(1)]. The skeletal system is the third most common site of metastases in term of both frequency and clinical effects, at autopsy as many as 60% of cancer patients are found to have osseous metastases.

In patients over 50 years bone metastasis are seen more frequently than all primary malignant bone tumors together. Bone metastasis are usually multiple and compromise the patient health by causing intense pain, interfering with surrounding neural and muscular structure, causing pathological fracture and disruption bone marrow [(2)].

More than 80% of bone metastasis are from breast, prostate, lung, thyroid, and kidneys [(2,3)].

Osteolytic bone metastasis is seen commonly than osteoblastic lesion but mixed lesion can be seen [(4)]

Metastases for all bones are situated predominately in red bone marrow, distributed usually centrally with rare peripheral involvement. spines are more often involved with metastasis, followed in frequency by the ribs, pelvis, proximal end of long bones, sternum and skull. [(5)]

Spinal metastases occur mainly in the vertebral bodies affecting lumbar region most often, followed by thoracic, cervical and sacral vertebrae[(2)].

Cancer spread to bone by either contiguous extension or hematogenous dissemination, the later being the method that determines the pattern of selective metastases.

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Contiguous extension is rare occurring in such lesions as pharyngeal carcinoma involving facial bones or in case of thoracic bones attack by mammary, lung, or esophageal tumor. These tumors are usually ulcerating or pyogenic since the periosteum acts as barrier to close non infected cancer.

Hematogenous discrimination involve malignant cells invasion of adjacent tissues, vascular penetration and transport to distant organs. [6]

Historically, Ewing was the major proponent of anatomically mechanical theories, while Pajet argued for the so called seed and soil hypothesis of variable organ susceptibility and differential tumors cell properties. Both theories have been validated and they are no longer considered to be mutually exclusive. Indeed interviewing mechanism of cancer metastasis to bone, it is evident that anatomically osseous and tumor cell factors all play role in determining the pattern of selective osseous metastases. [7]

The anatomical theory of metastasized cancer spread maintain that the specific vasculature involve determines the organ distribution of blood –bone metastases.

This idea is supported by the relationship between the spine the vertebral venous system and the pattern of prostatic carcinoma.[8]

MATERIAL AND METHOD:

A retrospective study conducted during the period from January 1990 - July 2000 in medical city complex histopathology department, 102 patients were enrolled in the study all were having histopathologicaly proved. secondary malignant bone tumors.

All patients were either having previously diagnosed primary tumor or bone tumor was the first presenting symptoms which was proved later on to be secondary.The study was conducted after studying histological reports and patients case sheat.

Good medical history, comprehensive clinical examination were done for each patient, stresses on age, sex, presenting bone symptoms, routine chemical and hematological lab tests were done for each patients addmited to medical or surgical wards.

Bence Johns protein, alkaline phosphates, acid phosphates serum protein electrophoreses, serum calcium were done whenever they are clinically relevant, x-ray survey for all bones, spine, ribs, long bones to search for other metastases.

C.T scan, myelography,T3& T4, thyroid scan were done for those with clinically relevant signs and symptoms.

All patients underwent surgical incisional biopsy or fine needle aspiration from subcutaneous bone or superficial masses and sending for histopathology.

The specimens were sent to histopathology department and have been studied and examined by an experienced histopathologist.

RESULTS:

The mean age of our patients was 42.8 years, with range (2-80 years), most of our patients are between 50-60 years. Male are predominantly involved 66.6 versus 33.3% (Table 1)

The study showed increased incidence of malignancy during the year 1991 in relation to other years with lowest in the year 1998 (fig 1).

The most common presenting symptoms of our patients were bone pain and pathological fractures which is mostly seen in the femur, Predominantly involving the neck. (table 2,3). Table 4 showed the skeletal site of secondary metastasis

Undetermined primary site was reported in 39 patients out of 102 (38.2 %), being male gender is more prone to have undetermined primary site (table 5), iliac bone is the most common bone involved by undetermined primary site, this table (5) also showed the primary site of malignancy reported in our patients .

Sixty four patients 62.7% showed osteolytic lesion radiologically, 14 patients 13.7% were osteobastic and 24 patients 28.5% showed mixed radiological pattern .table 6. Those with renal and thyroid tumor are 100 % radiologically osteolytic, 50 % of the with reticuloendothelial , prostatic and GIT tumors were radiologically osteoplastic (table-7)

Differentiated columnar epithelial tumor were the most histopathological type of metastatic malignant tumor 47 patient (46.7 %) followed by undifferentiated columnar and squamous type respectively.

DISCUSSION:

In our study the mean age of our patients was 42 years which is younger than that reports in other studies -50-70 years (5). This can be attributed to the early exposure of Iraqi person to risk factors or the more aggressiveness of the malignancies.

Men has been shown to be involved commonly than women with bone metastasis 68(66.6) vs. 34(33.3), this contradicts results of other studies [9] where women outweigh the number of man. More hazardous exposure of men in our community might explain this difference.

The prevalence of bone metastasis peaked in 1991 which was doubled that in other years. Probably the impact of second Gulf war and

usage of depleted uranium weapons played a role.

Bone pain was the usual presentation in our patients (table 2), seen in about 61.8% [5]. In our study femur is the commonest bone involved by fracture 19 patient 56. 5% , the same was true in other studies 41% cause pathological fractures ,69% of these is in the neck.[7]

As in other studies vertebrae are the commonest site of secondary metastasis, but humerus was the second most common site unlike in other studies were humerus was the forth commonest site [10]

In our study (table 5) lungs are the commonest primary site followed by prostate and kidneys, breast was the fourth most common primary site, these results contradict that reached in others, were breast was the leading primary site in female and prostate in male [7]. Some studies reported breast cancer in 30 % of all primary malignant tumors. The above differences can be attributed to low number of female involved in our study, changes in the pattern of malignancy in our society can also explain these differences.

Radiologically osteolytic bone metastasis was the commonest type (table 6), renal cell and thyroid malignant tumors were almost always seen as osteolytic (table 7), the same results were seen in other studies [11,12].

About one third of our patients, the primary site was still obscured after intense follow up (table 5), this was high in comparison to other studies in which only 10 % [5] remained undetected .

Differentiated columnar adenocarcinoma was the most histopathological type of bone metastasis.

Table 1: Number, Age, Sex, Incidence And The Percentage Of The Total Skeletal Secondaries (110) Cases.

Age	Male (%)	Female (%)
0-10	0	2 (1.9)
10-20	2 (1.9.)	4 (3.9)
20-30	1 (0.91)	1 (0.91)
30-40	1(0.91)	1(0.91)
40-50	7(7.14)	4 (3.9)
50-60	34 (33.3)	9(8.8)
60-70	19 (18.6)	10 (9.8.)
70-80	4 (3.9)	3 (2.9)
Total =102	68	34

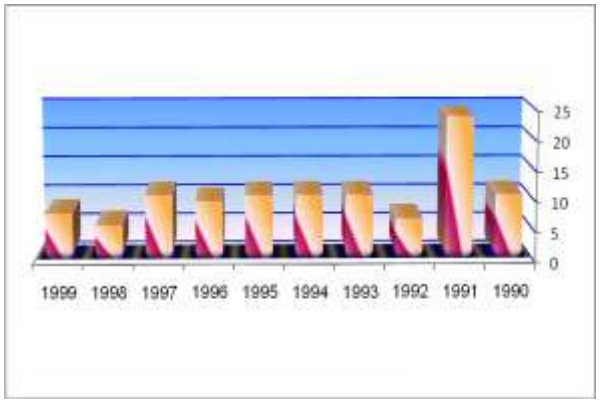

Figure 1: No of bone metastasis per year note.

Table 2: Patients main presenting symptoms

Presenting Symptoms	No	%
Pain	58	56.18
Paraplegia and lower limbs weakness	15	14.7
Generalized weakness	6	5.8
Mass	15	14.7
Accidentally discovered	8	5.45

Table 3: The cmmonest ten cancer in baghdad districts.

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	No.	No.	No.	No.	No.	No.	No.	No.
breast	266	130	121	277	84	28	20	23
Bronchus and lung	96	30	74	120	61	26	13	7
bladder	102	24	79	92	38	23	12	17
brain	67	35	70	89	30	15	18	9
leukaemia	113	23	47	83	21	13	15	7
colorectal	62	23	28	90	36	6	5	6
Non hodgkin lymphoma	53	25	35	43	27	12	6	13
stomach	41	14	34	47	19	9	2	7
Liver	37	13	27	45	19	7	9	3
larynx	36	9	27	21	12	15	6	4
total	687	337	542	918	347	156	106	96

No. of new cases by primary site, percentage of total in 2005

CONCLUSION:

Well differentiated columnar adenocarcinoma is the commonest histopathological type of malignant tumor metastases to bones, lungs are the most common primary site. Undetermined primary tumors are still consist a diagnostic problem in our daily practice more cooperative team work are needed to disclose the final diagnosis

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