The Pattern Of Primary Malignant Bone Tumors In Nassyriha

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الخلاصة

تمهيد :

تشكل العظام الجهاز الداعم في جسم الإنسان. إن معظم العظام تكون جوفاء يتكون الجزء الخارجي منها من شبكة من الانسجه الليفية تسمى نسيج مابين الخلايا بينما تسمى الانسجه الرخوة داخل التجاويف نخاع العظم و تحتوي العظام على نوعين من الخلايا يعملان بشكل متوازن تقوم احداهما بعملية البناء بينما تقوم الأخرى بعمليه الهدم والتقويم بحيث يبدو العظم وكأنه لا يتغير ولكن الحقيقة ان العظم في عملية تغير مستمر فعلى الدوام هناك تكوين لعظم جديد بينما يختفي العظم القديم نتيجة لعمل هذه الخلايا. ان العظم في عملية تغير مستمر فعلى الدوام هناك في ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولى ، إما الأورام السرطانية التي تنتقل إلى العظام من أنسجة أخرى في الجسم فتسمى بسرطان العظم الأولي ، إما وي ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك شأن بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك شان بقية أجزاء الجسم ، وتسمى الأورام السرطانية التي تنشأ في نفس العظم بسرطان العظم الأولي ، إما وي ذلك أورام السرطانية التي تنشأ في نفس العظم الثانوي أو المنتشر وي عديدة ومختلفة من سرطان العظم الأولي وتسمى هذه الأنواع تبعا للمنطقة التي تنشأ فيها من العظم أو

ان الدراسة الحالية معنية بسرطان العظم الأولي ونأمل في المستقبل القريب إن يوفقنا الله في دراسة سرطان العظم الثانوي او المنتشر .

الاهداف :

لمعرفة مدى انتشار أورام العظم السرطانية الأولية في محافظتنا(الناصرية) ورسم الخارطة الجغرافية لهذه الحالات ومقارنتها مع دراسات أخرى .

المطرق

خلال الفترة مابين تشرين الأول ٢٠٠٢ وتشرين الاول ٢٠٠٧ تمت دراسة (١٠١) حالة لأورام العظم السرطانية الاولية تم تصنيف الأورام حسب العمر ، الجنس ، ونسبة الإصابة بهذا الأورام وكذلك المنطقة الجغرافية .

النتائج:

تَضمنت الدراسة (٦٢) حالة للذكور ، و (٣٤) حالة للإناث وكانت نسبة الذكور للإناث (١.٩٧:١) تراوحت أعمار المرضى بين (٢٠- ٥) سنة وكان العقد الثاني من العمر هو الأكثر إصابة بهذه الأورام ومن مجموع (١٠١) حالة ، كان عدد المرضى المصابين بـ (ورم عظمي لحمي "غرن عظمي") (٣٥مريض) بينما كان عدد المرضى المصابين بـ (سرطان او ونك) (٢٤ مريض) والسرطان الغضروفي (١٤ مريض) وداء الأورام النقية المتعددة (١٢) والنخاعية الخبيثة (٩) والسرطان الليفي (٣ مريض) والسرطان الحبلي (مريض واحد) في حين لم يثبت التشخيص بشكل قطعي في ثلاث حالات من المرضى.

الاستناجات :

تبين الدراسة زيادة نسبة الاصابة باورام العظم السرطانية الاولية في السنوات الاخيرة في المحافظة (الناصرية) وخاصة الجزء الغربي من المحافظة كما تبين الدراسة ان الرجل اكثر اصابة من المراة . والعقد الثاني من العمر هو الاكثر اصابة بهذه الاورام.

ان دراسة هذه الحالات بشكل شامل وتفصيلي لا يزال يواجه بعض المعوقات التي نامل ونعمل على تجاوز ها من اجل تقليل الاصابة بهذه الاورام او محاولة اكتشافها مبكرا ليتسنى لنا اجتثاثها ومعالجتها.

<u>Abstract</u>

Background .Bone is the supporting framework of the body. Most bones are hollow. The outer part of bones consists of a network of fibrous tissue called matrix .The soft tissue inside hollow bones is called bone marrow. The bone itself contains 2 kinds of cells. The osteoblast and the osteoclast.Although bone often looks like it doesn't change much, the truth is that it is very active, new bone is always forming while old bone is dissolving.

The primary malignant bone tumors are tumors that start in the bone itself; these tumors that are true bone cancer are called sarcoma. There are several types of bone cancer .Their names are based on the area of bone that is affected and the kind of cells forming the tumor.

Objective. To present the pattern of malignant bone tumors in Nassyriha province (south of Iraq), geographical distribution of these tumors, and compares with other series.

Material and methods .Between October 2002 and October 2007, 101 patients with malignant bone tumors were collected .Clinical data concerning the age ,sex, the clinical presentations ,radiological features as well as gross appearance of affected bone were evaluated. Routine biochemical, haematological, and plain radiography was done for all patients. Bone scan, CAT scan ,and MRI were only performed some times.

Results. The study included 67 males and 34 females with males to females ratio 1.97:1. The patients age ranged between 5 and 70 years .The second decade was the most common age group of occurrence accounted for 65 patients. Out of the total 101 patients, osteosarcoma constituted the most frequent cancer, accounted 35 (34.65%) followed by Ewing's sarcoma 24 (23.76%), chondrosarcoma 14 (13.86%), multiple myeloma 12 (11.88%), malignant giant cell tumors 9 (8.91%), fibrosarcoma 3(2.97%) , and one case (0.99%) was chordoma .

No clear-cut diagnosis was recorded in 3 (2.97%) cases.

Conclusion. The results of the study suggest a rising incidence of primary malignant bone tumors. The peak incidence was in the second decade of life, and the male was more affected than female.

Key wards. Al Nassyriha, bone cancer, incidence, commonest cancer

Introduction

Cancer is a growing problem world-wide (WHO, 1995) which shows significant variation with time and across geographical entities.[1]

The term "sarcoma" was introduced by the English surgeon John Abernathy in1804 and was derived from Greek roots meaning" fleshy excrescence".

Under the auspices of the American College of Surgeon, Ernest Amory Codman(along with James Ewing and Joseph Bloodgood) created the Registry of bone sarcoma in 1921.

By the mid 1900s, great strides were being made in the United States in the field of bone pathology by Henry L.(1896-1979) and his colleague Louis Lichtenstein(1906-1977.[2]

Although the primary malignant bone tumors are relatively uncommon lesions that constitute less than 1% of all cancer worldwide[3]and 5% of childhood neoplasms,[4])these tumors are more prevalent in south of Iraq than they are in Europe.[5])

Primary malignant bone tumors may originate in osseous tissue (e.g osteosarcoma, chondrosarcoma, and malignant gaint cell tumor) or non osseous tissue(e.g Ewing 's sarcoma, fibrosarcoma, and chordoma).

Despite the cause of primary malignant bone tumors remains unknown, some researchers hypothesize that these tumors arise in centers of rapid skeletal growth(the affected patients seem to be much taller than average). Other theories point to heredity factors, trauma, and excessive radiotherapy as a cause.[3]

Some of these primary malignant bone tumors display marked inter-and intra-national variations in incidence, site, and age distribution.[6,7,8]

Patients and methods

Between October 2002 and October 2007, 101 patients with primary malignant bone tumors were collected from private and governmental hospital histopathological laboratories in Nassyriha province. Clinical data concerning the age, sex, clinical presentation, radiological features as well as gross appearance of the affected bone were evaluated.

67 of the patients were males and 34 were females. All patients had routine biochemical, haematological, and plain radiography. Bone scan, CTscan, and MRI were only performed some times.

Surgical interference in the form of amputation or wide excision was the first line of treatment according to the stage of the tumor which define the grade (low grade, high grade) ,the site(intracapsular ,intra compartment, extra compartment),and metastases (none, regional, distant).

Amputation was done in 33(32.68%) patients of osteosarcoma, 23(22.78%)Ewing 's sarcoma, 11(10.90%) chondrosarcoma, 7(6.93%) multiple myeloma, 8(7.92%) malignant gaint cell tumor, and 1 (0.99%) case of fibrosarcoma.

Wide local excision was done in 2(1.98%) of osteosarcoma, 1(0.99%) case of Ewing 's sarcoma, 3(2.97%) chondrosarcoma,1(0.99%) multiple myeloma, and 2(1.98%) of fibrosarcoma.

6(5.94%) cases were inoperable.

All patients were referred to oncology centre for chemotherapy, radiotherapy or both to reduce the chance of recurrence and metastases.

Chemotherapy was used in 49(48.52%), radiotherapy in 4(3.96%), and both chemotherapy and radiotherapy in 48(47.53%).

Follow –up ranged between 6 and 24 months.

Results

Age and sex distribution; of the 101 patients with primary malignant bone tumors, 67(66.33%) were males and 34 (33.66%) were females. The male to female ratio was (1.97:1). The age of patients ranged from 5-70 years(no patient aged below 5 years nor above 70). The second decade was the most common age group of occurrence accounting for 65(64.35%) cases. Table-1 shows the age distribution of the patients. **Table – 2 Shows the sex distribution.**

| Age of patients | No. of patient | % |
|-----------------|----------------|---------|
| 0 - 9 years | 13 | 12.87% |
| 10 - 19 | 65 | 64 .35% |
| 20 - 29 | 6 | 5.94% |
| 30 - 39 | 4 | 3.96% |
| 40 - 49 | 5 | 4.95 % |
| 50 - 59 | 5 | 4.95 % |
| 60 - 69 | 2 | 1.98% |
| 70 - 79 | 1 | 0.99% |

(Table – 1) Shows the age distribution.



Figure-1 shows the age distribution of the patients.

| Sex of patients | No. of patient | % |
|-----------------|----------------|--------|
| Male | 67 | 66.33% |
| Female | 34 | 33.66% |
| Total | 101 | |
| | | |

(Table – 2) Shows the sex distribution.



Figure-2 shows The sex distribution of the patients.

Clinical features; pain was the dominant complain in 87 (86.13%) patients ,palpable swelling in 73(72.27%) patients, pathological or impending fracture was recorded in 15 (14.85%) patients, ulceration was noticed in 5 (4.95%) patients, and 3 (2.97%) patients presented with clinical feature of osteomyelitis. Table -3 shows the clinical features (presentation)

| Presentation | No. of patient | % |
|------------------------------------|-------------------|--------|
| Pain | 87 | 86.13% |
| Palpable swelling | 73 | 72.27% |
| Pathological or impending fracture | 15 | 14.85% |
| Ulceration | 5 | 4,95% |
| Clinical features of osteomyelitis | 3 | 2.97% |

(Table – 3) Shows the clinical features (presentation).





The anatomic distribution of the primary malignant bone tumors ;the femur was the most frequent site of affection ,seen in 59(58.41%) cases .The vertebrae comes next to femur in the order of incidence of affection,18 (17.82 %) cases are recorded, 15 (14.85%) cases affect the tibia, and 9 (8.91 %) cases affect other sites of the body. **Table -4 shows the anatomical distribution.**

| Anatomical site | No. of patient | % |
|-----------------|----------------|---------|
| Femur | 59 | 58.41% |
| Vertebrae | 18 | 17.82 % |
| Tibia | 15 | 14.85% |
| Others | 9 | 8.91% |

(Table -4) shows the anatomical distribution.



Figure-4 shows the anatomical distribution

The histopathological results shows that osteosarcoma was diagnosed in 35 (34.65%) patients, Ewing's sarcoma in 24 (23.76%), chondrosarcoma in 14 (13.86%), multiple myloma in 12 (11.88%), malignant gaint cell tumor in 9 (8.91%), fibrosarcoma in 3 (2.97%), and chordoma in one(0.99%) patient. No clear cut diagnosis was recorded in 3 (2.97%) patients. Table – 5 Demonstrates the histopathological results.

| Histopathological results | No. of patient | % |
|---------------------------|----------------|--------|
| | | |
| Osteosarcoma | 35 | 34.76% |
| Ewing's sarcoma | 24 | 23.76% |
| Chondrosarcoma | 14 | 13.86% |
| Multiple myeloma | 12 | 11.88% |
| Malignant gaint cell | 9 | 8.91 % |
| Fibrosarcoma | 3 | 2.97% |
| Chordoma | 1 | 0.99% |
| No clear cut diagnosis | 3 | 2.97% |
| | | |
| Total | 101 | |

(Table-5) Demonstrates the histopathological results .



Figure -5 shows the histopathological results.

The geographical distribution; the west part of Al Nassyriha province(including Suq-Alshyuk, Nwashi and Om ehnag) was the most common part affected, 61 (60.39%) cases were recorded from this part.

The malignant transformation was noticed in 3(2.97%) cases of bengin gaint cell tumor, 2 (1.98%) cases of chondroma ,and one (0.99%) of diaphyseal acalasia. Table -6 shows the malignant transformation.

| Type of benign lesions | No. of patient | % |
|---------------------------|----------------|-------|
| Benign gaint cell | 3 | 2.97% |
| Chondroma | 2 | 1.98% |
| Diaphyseal acalasia | 1 | 0.99% |
| Total | 6 | 5.94% |

$(Table-6\)$ Shows the malignant transformation.



Figure -6 shows the types of the lesion.

Biopsy; open Biopsy was done in 83(82.17%) patients. Needle aspiration was done in 18 (17.82%) patients. Table-7 shows the types of biopsy

| (Table - 7) | Shows | the types | of biopsy. |
|-------------|-------|-----------|------------|
|-------------|-------|-----------|------------|

| Type of Biopsy | No. of patient | % |
|-------------------|----------------|--------|
| Open incisional | 83 | 82.17% |
| Needle aspiration | 18 | 17.82% |
| Total | 101 | |



Figure-7 shows the types of the Biopsy.

Types of surgery;86 (85.14%) ended up with amputation, 9 (8.91%) patients had wide local excision, and 6 (5.94%) were inoperable. |Table -8 shows the types of surgery.

| (Table – | 8) | Shows | the | types | of | surgery. |
|----------|----|-------|-----|-------|----|----------|
|----------|----|-------|-----|-------|----|----------|

| Types of surgery | No. of patient | % |
|-------------------------|----------------|--------|
| Amputation | 86 | 85.14% |
| Wide local excision | 9 | 8.91% |
| Inoperable | 6 | 5.94% |
| Total | 101 | |



Figure-8 shows the types of the surgery.

Local recurrences were noticed in amputation stump in 4(3.96%).

All patients were referred to oncology centre for chemotherapy, radiotherapy or both. All the amputees were referred to the prosthesis centre for fitting. The 2 year survival rate was (37%).

Discussion

In the present study, osteosarcoma was the most common primary malignant bone tumors accounting for (34.65%).Iraqi cancer registry during the period(1995-1997) found that osteosarcoma was the most common primary malignant bone tumors accounting for (43.2%).[9]

Hamdan study in the south part of Iraq showed that osteosarcoma was the most common tumor in the period (1980-1999) accounting for (26%) of total registered primary malignant bone tumors.[10]

A Study done in the northern part of Iraq found that osteosarcoma was the commonest tumor (45%) in the period (1980-1990). However, 10 years later Ewing's sarcoma was reported to be the leading primary malignant bone tumors accounting for (31.3%) followed by osteosarcoma (28%) as reported by the same worker.[11]

Ewing's sarcoma was reported as the most common primary malignant bone tumors by Katchy et al in Kuwait.[12]

Primary malignant bone tumors had an early peak in the second decade of life and strong male predominance. This is explained by the high frequency of osteosarcoma and Ewing's sarcoma. Both together comprised about (58.41%) of the primary malignant bone tumors. An observation similar to Katchy study in Kuwait [12]

Regarding the site ; primary malignant bone tumors often involved the femur(58.41%), vertebrae(17.82%),tibia(14.85%),and less commonly; the pelvis(4.95%) ,hummers(2.97%) and ribs(0.99%). A similar observation was recorded in Jarrallah study, about the pattern of osteosarcoma in the southern part of Iraq. [13]. A study in Kuwait by K .C. Katchy, shows that the pelvis is the most commonly involved of Ewing 's , lower extremities of osteosarcoma, and vertebra, humerus and ribs of chondrosarcoma .[12]

In this study, it was noted that the prognosis of the patients is greatly affected by the size of the tumor. e.g 82 patients had tumor size greater than 5 cm which may reflect the delayed presentation and diagnosis of most of the patients and so explain the need for amputation in 86 cases, and inoperability in 6 patients. This effect of the tumor size on the prognosis was also recorded in other studies.[10,14]

Positive family history of malignancy was recorded in 7 patients, so obtaining family history is an important aspect of the evaluation. An observation similar to Hamdan study showed that 10 patients proved to have a family history of malignancy.[10] The genetic predisposition is a well –documented fact.[15]

All patients were subjected to Biopsy. Bone biopsy is probably the most crucial aid for the definitive diagnosis of malignant bone tumors. Only 18 patients had fine needle aspiration, and open incisional biopsy was done for83 patients.. The large number of the patients was subjected to open incisional Biopsy because of shortage of the highly advanced technique (e.g. use of ultra-sound-guided needle [16] and lack of the experienced pathologist in our province. Some difficulties were noticed regarding the results of biopsy in this study, probably because the most difficult tissue to be interpreted is sample taken from bone tumor, performing more sophisticated investigation in addition to get the opinion of more than one pathologist, orthopedic surgeon, oncologist, radiologist may solve some of these difficulties.

Malignant transformation was noticed (6 patients had malignant transformation), so excision of premalignant, borderline or benign lesion is recommended.

Surgical treatment in the form of excision or amputation alone may lead to cure, but using chemotherapy, radiotherapy or other modalities in addition to surgical treatment will reduce the chance of recurrence and metastases. Chemotherapy was used in 49 (48.52%) ,radiotherapy in 4 (3.96%),and both chemotherapy and radiotherapy in 48 (47.53%). The delayed presentation and refusal of surgery in the initial stage ended high number of patients with amputation and inoperability in this study.

9 patients had wide local excision with gratifying results. Bone cement was used to fill the defect. There are many other options in use to fill the gaps .[17,18,19,20,21]

Local recurrence in amputation stump was recorded in 4 patients, whoever, the margin of the resection which should be reasonable and should include a cuff of normal tissue is the most important factor to reduce the recurrence.

The west part of Al Nassyriha province is the most frequent part of affection, 61(60.39%) cases were recorded from this part, which may reflect the relation between the malignancy and the exposure to the radiation. A study about health consequences of D.U weapons used by U S and British forces, shows increasing registration of different

type of cancer cases and change in the epidemiological pattern with the time among military personnel who were in the southern region of Iraq.[22]

Complete coverage of bone cancer still had some difficulties in our situation because of lack of active cooperation of medical staff to provide detailed medical information; some of our patients were seeking medical advice in near cities and Baghdad, neglection as a result of poverty, lack of education, and limitation of CT scan and MRI facilities.

<u>*Conclusio*n</u>

1 -The results of the study suggest a rising incidence of primary malignant bone tumors.

- 2 The second decade of life was the most frequent age group of affection.
- 3 The male was more affected than female.

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