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CLINICAL FINDINGS OF BASAL CELL NEVUS SYNDROME

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ABSTRACT

Background Basal cell nevus syndrome or Gorlin syndrome is a rare genetic autosomal dominant disorder associated with different neoplasms that may be aggressive with further aging so that earlier diagnosis of this syndrome is crucial

Aim of the study : The aim of this study is to present different clinical pictures and diagnostic means to facilitate identification of patients affected by basal cell nevus bifid rib syndrome

Patients and Methods : Seven patients presented with basal cell nevus syndrome were investigated through reporting medical and dental history, clinical and radiological examinations, histopathological investigations, routine laboratory investigations and referral to different specialties as dermatology, neurosurgery and orthopedics.

Results : All the patients presented with odontogenic keratocysts, bifid ribs, skin nevi, and skeletal disorders with three patients having family history affected by the same findings.

Conclusion: Basal cell nevus bifid rib syndrome has different clinical presentations and many specialists of different specialties as maxillofacial surgery, neurosurgery, dermatology and others must be aware of them,also affected patients need frequent, follow up to avoid any complications associated with this syndrome .

KEY WORDS: Basal cell, nevus., bifid rib, keratocyst, syndrome.

INTRODUCTION

Basal cell nevus bifid rib syndrome is a rare syndrome that happens as 1 for each 570000, it is an interesting subject for dental and maxillofacial specialists, because of its important findings that affects the skull, Jaws, spine, skin, brain and ovary[1]. the most prevalent lesion that affect the jaw in this syndrome is odontogenic keratocyst which may be multiple and recurrent also there is multiple skin nevi that is scattered throughout the skin surfaces and many of them are basal cell cacinomas [2].

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identification of this syndrome can protect the patient from development of basal cell carcinoma if the nevi excised earlier. patient may need follow up after surgical excisions of keratocyst due to recurrence rate also neurologic disorder can be discovered as brain calcification and meningioma [3]. So that it is important for the dentists and maxillofacial specialists to have information for this syndrome.

PATIENTS AND METHODS

All the patients presented by clinical findings of basal cell nevus bifid rib syndrome from January 2019 to May 2023 in department of oral and maxillofacial surgery FACULTY OF ORAL AND DENTAL MEDECINE SOUTH VALLEY UNIVERSITY were registered as regards age, sex, complaint also medical,dental and family history, sun exposure history were documented, transthoracic echocardiography, abdominal and pelvic ultrasonography examinations also done for the patients, the patients referred to neurosurgeons and dermatologists to exclude any tumors associated with the syndrome also routine blood laboratory investigations as liver and renal function tests were requested . the radiological assessment was fulfilled using helical computerized tomography (TOSHIBA TSX-303A PRIME AQUILION)) device,the cystic lesions in both maxilla and mandible were measured and their volumes were regesterd all the patients arranged for surgical enucleation of the keratocysts followed by peripheral ostectomy under general anesthesia except one male patient was managed under local anesthesia

All the patients were followed weekly after operation for one month and monthly for sex months, then the patients followed clinically, and CT made only for the patients with current lesions

RESULTS

Numbers of the patients through this study was seven patients, four of them were females and the other were males the chief complains were as shown in table 1. The complaints were different between

TABLE (1) Showing age sex and the complaints of the patients

Patient number	Age in year	Sex	Complain	MEDICAL HISTORY	SURGICAL HISTORY	FAMILY HISTORY
1	18	Female	Facial asymmetry due to left maxillary swelling	No systematic disorders	No related surgical history	Positive family history
2	48	Female	Slight tenderness due to multiple mandibular swelling	No systematic disorders	No related surgical history	Positive family history
3	7	Female	Tender right site mandibular swelling	No systematic disorders	No related surgical history	Positive family history
4	70	Male	Pain due to infected anterior maxillary swelling	Cardiac insufficiency disorder	No related surgical history	Negative family history
5	35	Male	Pain and fistula from recurrent left site mandibular swelling	No systematic disorders	Previous history of surgical removal of left site mandibular cyst	Negative family history
6	27	Male	Facial assymmetry due to right site mandibular swelling	No systematic disorders	No related surgical history	Negative family history
7	40	Female	Tender bilateral mandibular swelling	No systematic disorders	No related surgical history	Negative family history

the patients some of them complaining of facial asymmetry, the other complaining of tenderness or pain related to facial maxillofacial swelling, one patient gave a history of surgical excision of a cyst from left site of the mandible,and three patients (mother and her two daughters) have the syndrome

As showed in table 2, all the patients have odontogenic keratocyst, one female patient has both maxillary and mandibular cysts in the left site and two female patients has multilocular keratocysts affecting the mandible and presented in both right and left site, and in one female patient presented with right site mandibular cyst, and in one male patient large keratocyst was found in anterior maxillary site that extends from canine to canine with nasal floor bone resorption, one patient with multiple left site mandibular keratocysts, and one patient has large left site maxillary keratocyst,that extends from the canine tooth to the third molar region and occupying the maxillary sinus

Keratocysts were found in maxilla in two cases only, while it is discovered in the mandible in five cases,different radiologic presentations, shown in (figures1-3) the mean of keratocysts volume was 17,5cc with standard deviation±12,5, the material which was aspirated was thick creamy material that indicated the presence of keratin, also the histopathology (figure 4) revealed cystic lesion that

TABLE (2) Showing the different clinical finding affected by the syndrome

Patients Serial number	Maxillofacial finding and skull	Skin	Skeleton	Echocardiography	Pelvic ultrasonography for female	Keratocyst volumes
1	Left site mandibular keratocyst, ,Large Maxillary keratocyst,.falx cerebri calcifications, open bite ,	Basal cell nevus palmer pits,	Bifid ribs, kyphoscoliosis	Normal echo-Doppler study	Average size uterus no sizable fibroids and no ovarian cysts	Maxillary cyst 36cc Mandibular cyst 3cc
2	Large mandibular keratocyst from right to left molar areas,. falx cerebri calcifications, , ,palmer pits	Palmer pits. Skin nevi	Bifid ribs, , kyphoscoliosis	Diastolic disfunction grade1 Trace mitral and tricusped valves regurgitation	Average size uterus no sizable fibroids and no ovarian cysts	30cc
3	Left mandibular keratocyst, ,falx cerebri calcifications,		Bifid ribs, ,	Normal echo-Doppler study	Average size uterus no sizable fibroids and no ovarian cysts	6cc
4	Large anterior maxillary keratocyst, brain calcification	Skin nevi palmer pits	Bifid rib, kypohoscoliosis	Ischemic heart disease , diastolic dysfunction grade1, mild mitral regurgitation and trace tricuspid regurgitation		12cc
5	Left site mandibular recurrent multiple keratocysts , brain calcification,	Skin nevii , palmeer pits	Kyphosis, bifid rib ,	Normal echo-Doppler study		10cc
6	Large right site mandibular keratocyst , cerebral calcification,	Skin nevi, palmer pits	Bifid ribs kyphosis	Normal echo-Doppler study	Average size uterus no sizable fibroids and no ovarian cysts	13cc
7	Large mandibular keratocyst from right to left molar areas, , falx cerebri calcification, class2 malocclusion,	Skin nevi, milia and palmer pits	Bifid ribs and kyphosis	Normal echo-Doppler study		30 **cc** mean 17,5cc standard deviation ±12,5

was 4- 5 cells thick, the basal layer nuclei arranged in palisaded pattern, with absence of rete pigs and there is flat interface between the basal epithelial layer and the underlying connective tissue. the superficial epithelial layer was Para keratinized in all cases, also daughter cysts were documented in four cases as in (figure 5, 6) keratocysts managed by surgical excision (figure 7) and recurrence occurred in two cases. The keratocyst discovered in these cases managed by enucleation followed by peripheral ostectomy under general anaesthesia,.as regards sun exposure all the patients of the study live in upper Egypt whose weather is sunny all the day, however the females are indoor working and the male patients work in closed offices As regards nevi, they were discovered in all patients,they were multiple, in some patients appeared as elevated papules and in other patients appeared flat macules, with brown, black or dark blue discoloration,in face, arms and back, there was no ulcerations,nor crusting,one patient has milia as in (figures 8- 10) there was no complain as regards nevi or milia, biopsy for the nevi showed nevus cells with regular nuclei and regular cytoplasm with no necrosis nor mitosis(figure 11) Some patients shown palmar pits as in (figure 12) All the patients showed different calcifications of the brain and falx cerebri as in (figure 13a-i) also bifid ribs and scoliosis were discovered in all patients through this study as in (figures14a-b) and (15 a,b,c) respectively, mal occlusion was found in two patients as in (figure16a,b), also one patient presented with deformed little fingers of both hands (figure 17) the routine laboratory investigations were normal for all seven patients,, there were no brain or skin tumors .and as regards echo cardio graphic study there was no cardiac fibromas and only one patient had ischemic heart disease, the abdominal and pelvic ultrasonography for the females throughout this study revealed no fibroid lesion and no ovarian cyststs

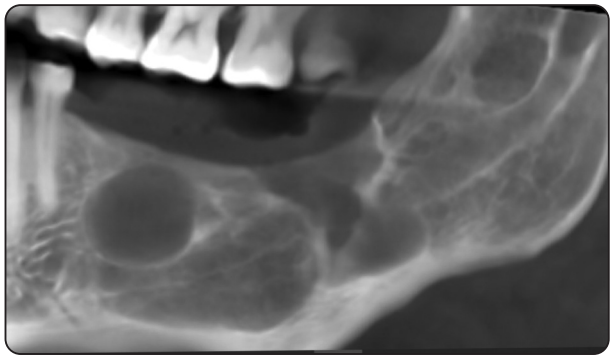

Fig. (1) Panoramic veiw showing multiple keratocyst at left site of the mandibl

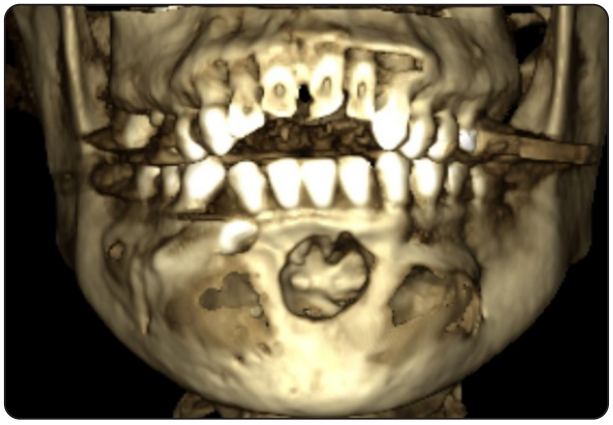

Fig. (2) 3Dveiw showing anterior mandibular multilocular keratocyst

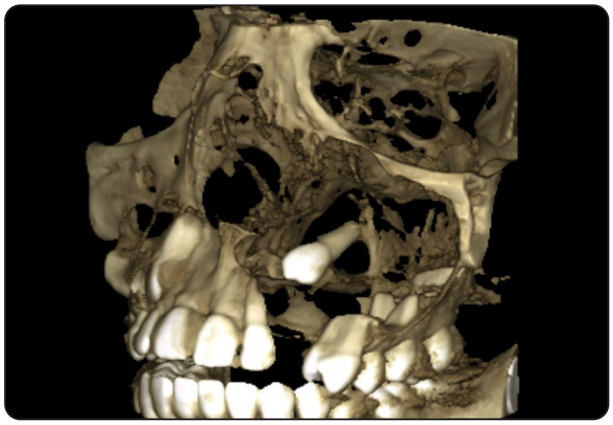

Fig. (3) showing 3D veiw of keratocyst encroaching the maxillary sinus

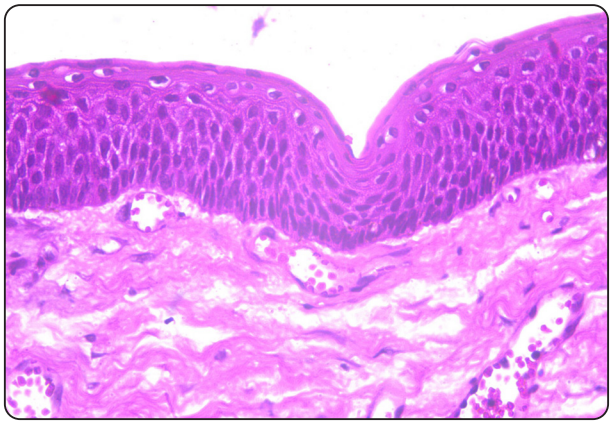

fig. (4) keratocyst showing 4- 5 cells thick epithelium and the basal layer nuclei arranged in palisaded pattern , with absence of rete pigs

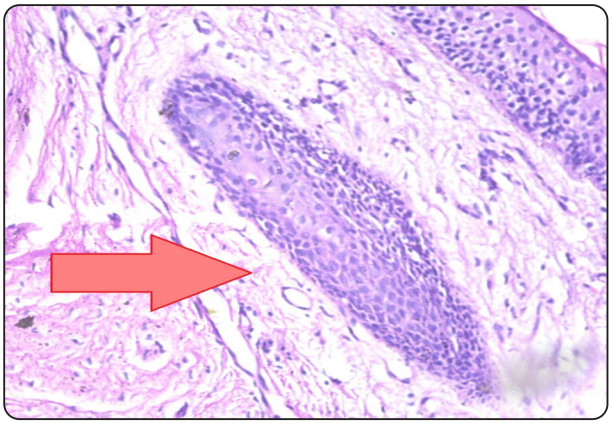

Fig. (5) showing elongated daughter cyct

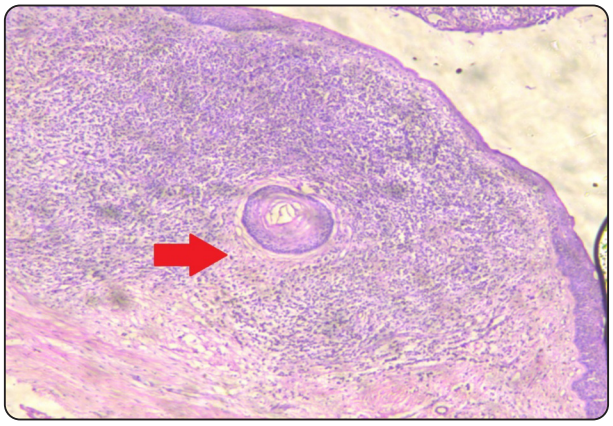

Fig. (6) Showing round daughter cyst

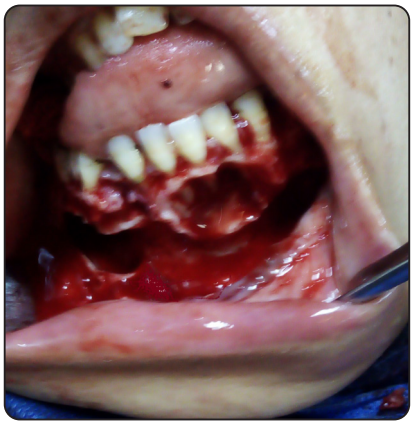

Fig. (7) keratocyst, showing multiple cavitations

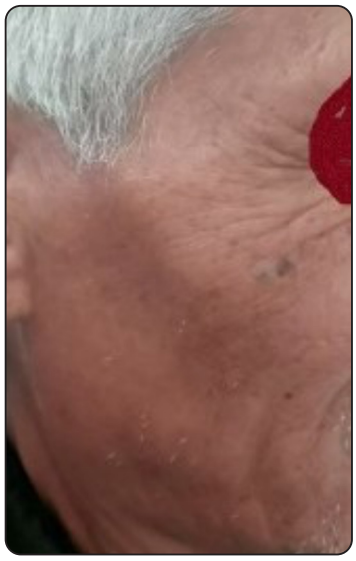

Fig. (8) flat blue and black nevus

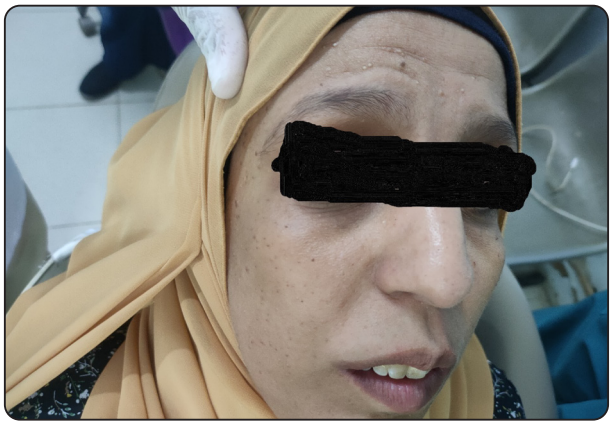

Fig. (9) multiple nevi and milia

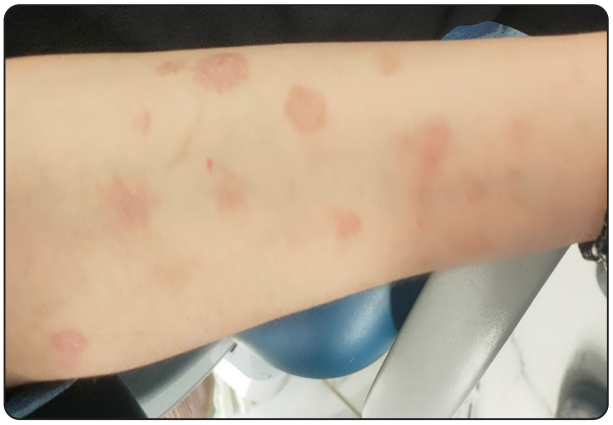

Fig. (10) multiple nevi and milia

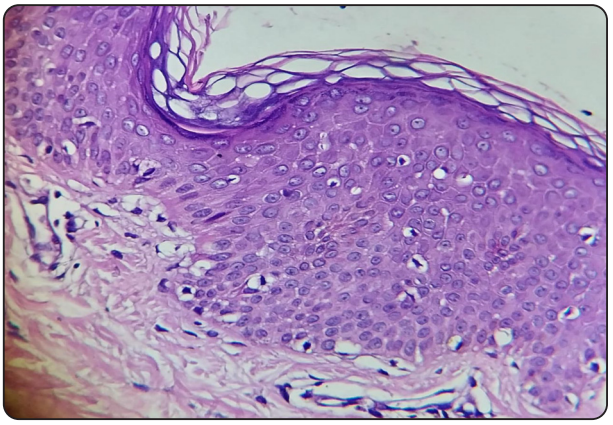

Fig. (11) multiple nevi and milia

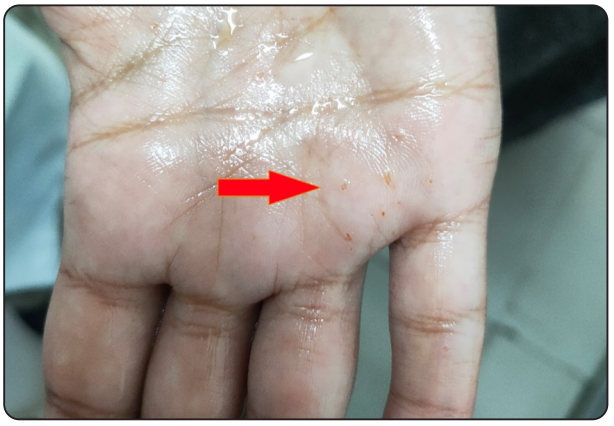

Fig. (12) showing palmer pits

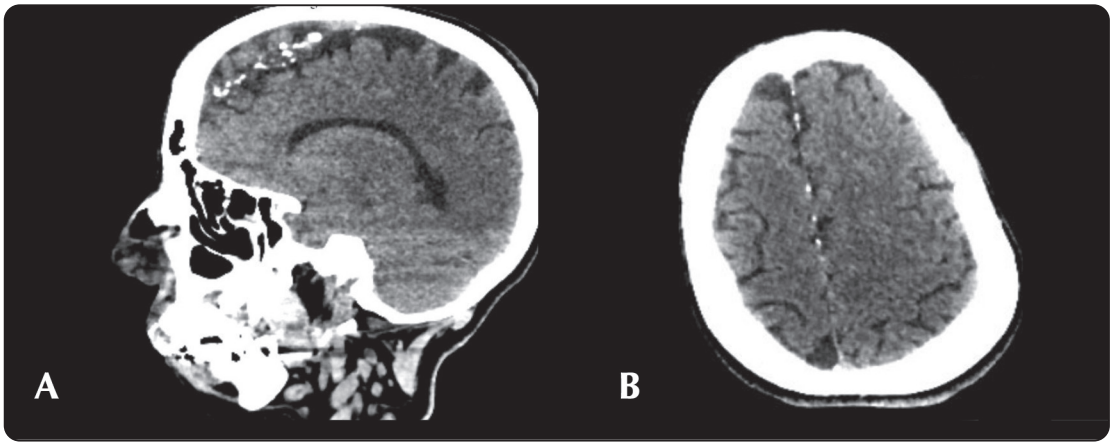

Fig. (13) A CT sagittal view showing falx cerebri calcification. (B) CT axial section showing falx cerebri calcification

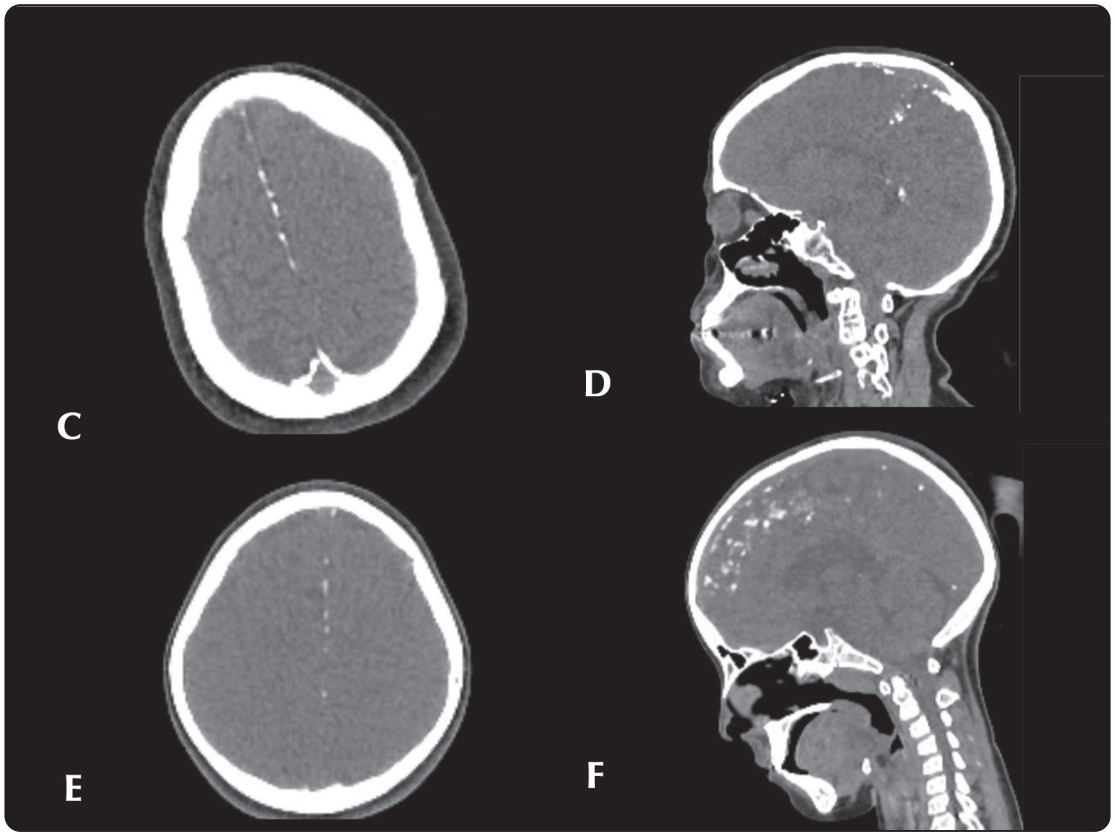

fig. (13) (C) CT axial section showing falx cerebri calcification (D) CT sagittal view showing falx cerebri calcification (E) CT axial section showing falx cerebri calcification. (F) CT sagittal view showing falx cerebri calcification

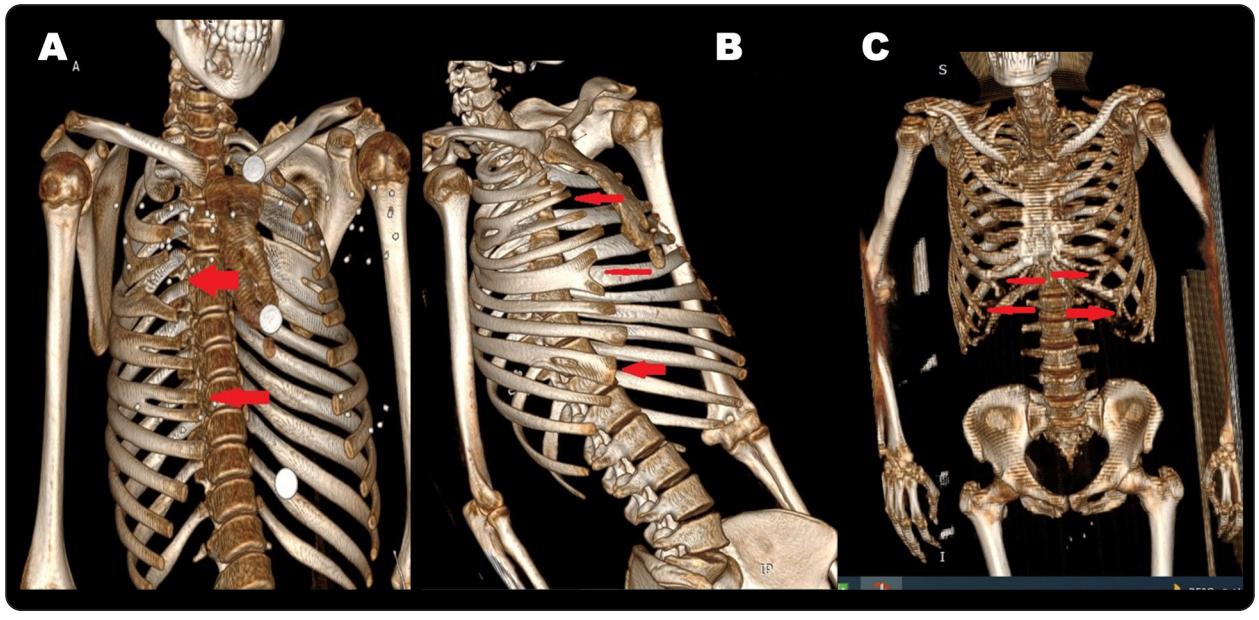

fig. (14) (A) CT 3D view showing bifid rib (B) CT 3D view showing bifid rib in lateral position. (C) CT 3D view showing bifid rib in anteroposterior direction

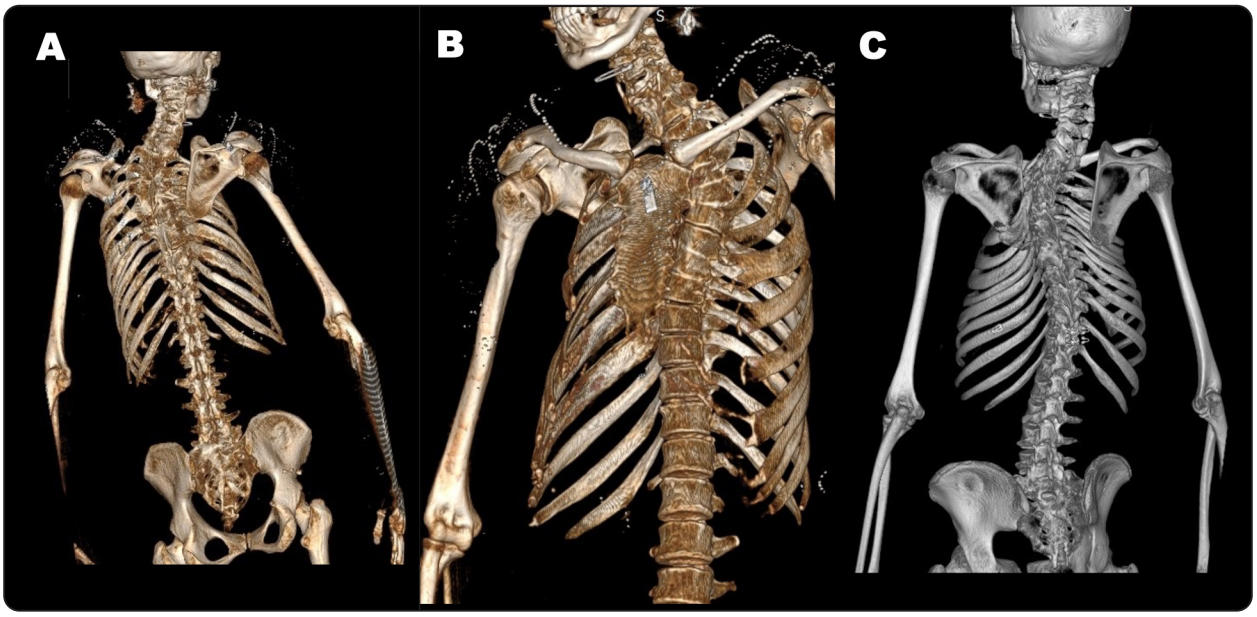

Fig. (15) (A) CT 3D view showing kyphoscoliosis. (B) CT 3D view kyphoscoliosis lateral view (C) Kyphoscoliosis posterior veiw

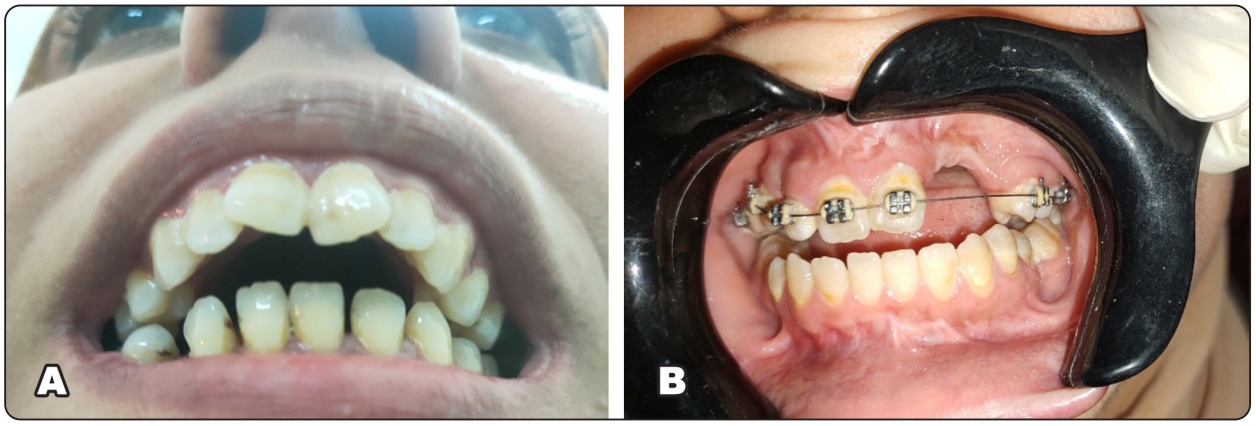

Fig. (16) A mal occlusion(open bite) (B) MALOCCLUSION

fig. (17) Little fingure deformity

DISCUSSION

Basal cell nevus syndrome is a rare syndrome inherited as dominant trait, due to mutation in PATCH1 gene on cromosome9q22.3\q31 it may have familial tendency, however many individual cases were discovered solely [4]. in our study there is a mother with her two daughters having the syndrome, and this indicates the role of inheritance in basal cell nevus syndrome, while the other patients has no familial history, the most prominent criteria of basal cell nevus syndrome throughout this study was the presence of odontogenic keratocyst in

all patients, the keratocyst is considered the main criteria of basal cell nevus syndrome according to the study of Ul Khaliq et al [5]. The study of Kimonis et al. reported that 74% of basal cell nevus syndrome patients presented odontogenic keratocyst, [6] in the study of Israr et al [7] And Ul Khaliq et al [5]. discovered keratocyst in 100% of the patients of their studies and this is similar to this study . the growth and behavior of keratocyst in this syndrome is not different to that occur solely throughout this study the mandible was the most prevalent site of the keratocyst and this finding is stated by Israr et al [7]. All keratocyst managed by surgical excision, and recurrence occurred in two cases after 5 years, the study of Ul Khaliq et al [5]. Stated that recurrences manifested within 5-7 years due to aggressiveness and recurrent rate of the keratocyst it is called keratocyst odontogenic tumor [8]. As regards basal cell nevi was discovered in all patients, the nevi were found on sun exposed and nonexposed areas the nevi discovered having different colors as blue, black or brown also were in different forms as papule, macules or milia, this was in accordance to the study of Titou et al[9] . Our patients warned against sun exposure and referred to dermatologists for follow up of skin lesion and to avoid its progressive behavior, the basal cell nevi discovered throughout the study was benign, non ulcerative, in our study nevi were discovered in all patients, in the study of Fernandez et al[10] the nevus occurred 50 -65%% of patients, these nevi may be transeformed into basal cell cacinoma according to the study of Lo Muzio [11]. however the basal cell nevus syndrome can be presented without presence of basal cell carcinoma according to Israr et al[7] and marx et al [12]. Palmoplanter pits were present in in 6 cases through this study, and according to the study of Borghesi et al[13]. palmer pits occurred in 80-90% of cases and may be present due to delayed maturation of epidermal basal cells that leads to premature desquamation and appearance of these pits.

And according to Marx and Stern[12] . all the pits can be highlighted by coating the hands by betadine povidone iodine and wiping by moist cloth. Brain calcifications in falx cerebri in this study were found in all patients in different presentations, and according to Daniel and Michael[14]. Lamellar calcifications of the falx cerebri have been reported in 70 to 85%,and calcification of the tentorium cerebelli occurs in 20 to 40% of patients where calcification of the petroclinoid ligament occurs in 20% of affected individuals. The intracranial calcifications may have no clinical significance but they may be critical in diagnosing the syndrome According to Amir et al[15]. Calcifications can be physiologic, dystrophic congenital, or vascular. They can also be due to infections, inflammatory lesions such as sarcoidosis and tumors. Intracranial calcifications can also occur in rare idiopathic disorders such as, Fahr disease[16]. Another brain tumors as medulloblastoma and meningioma can be found in this syndrome[17]. Rib deformity was discovered in five patients in different patterns through this study, while LO MOZILO[11] .reported rib anomalies in 38 %of cases. Through his study there was no any complaints as regards respiratory system .

This study presents many obvious clinical signs of basal cell nevus bifid rib syndrome, where there is major criteria as presence of basal cell carcinoma, odontogenic keratocyst, palmer and planter pits, calcifications of falx cerebri, bifid ribs, First-degree relative with the syndrome while the minor criteria includes macrocephaly, frontal bossing, sprengel, digits abnormality, malocclusions, bridging of sella turcica, ovarian fibroma, medulloblastoma, to have basal cell syndrome the patient may present two major criteria or one major criteria and two minor criteria[13] .all patients through this study fulfilled criteria that were enough to consider diagnosis of nevoid basal cell syndrome.

The limitations through this study is the lack of genetic inestigations,and this is due to un availability of this tests in our environment and high cost for requisting

The positive items through this study is presentations of different radiological findings of odontogenic keratocysts, bifid ribs, kyphoscoliosis, obvious histopathological evidence, malocclusions, different types and discoloration of nevi and all these can facilitate early diagnosis of the syndrome, with chance to get earlier care for the affected patients

CONCLUSION

Basal cell nevus bifid rib syndrome has different clinical presentations and many specialists of different specialties as maxillofacial surgery, neurosurgery, dermatology and others must be aware of them, also affected patients need frequent, follow up to avoid any complications associated with this syndrome .

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Availability of data and materials

All data can be requested from the corresponding author

Declarations

Ethics approval and consent to participate

Written informed consent was obtained from the patients to use any accompanying images for the purpose of journal manuscript publication.

A copy of the written consent is available for review by the journal. Ethical approval was obtained from the ethical committe of faculty of medecine, SOUTH VALLEY UNNIVERSITY

Competing interests

We declare that this research has no conflict of interest

AUTHER CONTRIBUTION

Altaib Abd Al razik: surgery, writing and reviewing,

Eisa M Hegazy: dermatologic examination, writting and reviewing

Amr Abd Almoez pathological examination

Ahmed Bastawy:writting and reviewing,

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