ORIGINAL ARTICLE

Glomus tumours: Outcome based on tumour location in hand

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Abstract

Objective: To determine the clinical outcome of patients with glomus tumour in nail matrix and nail bed that were excised with transungual approach.

Methodology: The case series was conducted at the Allied and District Headquarter Hospital, Faisalabad, Pakistan,from January 2012 to June 2014, and comprised patients with glomus tumour at finger tipswhose diagnosis was confirmed with biopsy results. Variables noted were the location of the tumour in the nail i.e. either nail matrix or the nail bed.

Results: Of the 8 patients in the study, 5(62.5%) had tumours located in the nail matrix and 3(37.5%) in the nail bed. Three (60%) patients with nail matrix tumour had prolonged pain sensation, whereas none (with nail bed lesion had prolonged pain sensation.

Conclusions: There was no recurrence but anatomic location of the subungual glomus tumour at initial presentation can predict postoperative prolonged pain.

Keywords: Glomus tumour, Glomusbody, Nail bed, Nail matrix, Transangual approach. (JPMA 65: S-3 (Suppl. 3); 2015)

Introduction

Glomus tumours are rare benign neoplasm arising from the glomus body mainly found under the nail or on the fingertip, accounting for less than 2% of all soft tissue tumours.[1]

A glomus body is an arteriovenous anastomosis that controls the body temperature. Glomus tumours refer to hyperplasia of the glomus body.[2] Their pathological findings were first described by Masson in 1924, being referred to as tumours that occur in the neuromyo-arterial body.[3]

Glomus tumours can be classified as either solitary or multiple, according to their clinical presentation. Solitary glomus tumours are far more common than the multiple variant. According to Rettig and Strickland, the solitary variant is mostly found in the fingers, with 25%-75% occurring in the subungual region, which are more frequent in women. Multiple glomus tumours are reportedly painless in general, of a pink or purple nodal shape, and develop in young children or males.[4,5]

Glomus tumours have a characteristic triad of paroxysmal pain, tenderness and temperature sensitivity which are significant in reaching diagnosis. Other symptoms include the distinctive subungual discoloration, hypoesthesia, atrophy, osteoporosis in the lesion and autonomic disturbance such as Horner syndrome.[6]

The cause of pain in glomus tumours is still not clear, but according to many theories the capsules of the tumours render them sensitive to pressure; abundant mast cells in the glomus tumours release substances such as heparin, 5-hydroxytryptamin, and histamine, causing receptors to be under pressure or cold stimulation to be sensitive. Such factors incite severe pain even to ordinary stimulation. Furthermore, excessive dominance over the nerve of numerous non-myelinated nerve fibres that penetrate into glomus tumours has been identified as a cause of pain.[7,8]

Diagnosis of glomus tumour can be made on an accurate history and physical examinations. However, in many cases, such clinical symptoms are not clear-cut, and lesions are difficult to locate, as they are usually smaller than 1cm. Clinical diagnostic tests including Love's pin test, Hildreth's test, or a cold-sensitivity test can be helpful, but still have limitations in leading to accurate diagnosis. Positive Love's pin test means patients experience severe pain when the skin overlying the tumour is pressed with a pinhead, ballpoint pen, end of a paperclip, or Kirschner wire. Hildreth's test is performed by elevating the patients' arm to exsanguinate it. A tourniquet is inflated to 250mmHg and the tumour is palpated; the pain and tenderness should be reduced. A test is positive when releasing the cuff causes a sudden

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onset of pain and tenderness in the area of the tumour. The cold-sensitivity test is positive when immersing the hand in cold water elicits severe pain in and around the lesion.[9,10]

Additional tests such as a simple X-ray, computed tomography (CT) angiography and ultrasonography can be conducted for more accurate diagnosis. Magnetic resonance imaging (MRI) can also be useful for cases with less distinct clinical signs and symptoms. When performing a simple X-ray test, inciting pressure atrophy to a distal phalanx can yield findings that seem like osteocystoma or erosion, or no abnormal findings. Thus, diagnosis can be made based on the unique simple X-ray test findings after giving pressure to a distal phalanx if more than two years have passed since the occurrence of a tumour. However, diagnosing early-stage lesions requires more careful physical examinations and additional imaging tests.[11]

MRI is not invasive and it provides excellent contrast between a neoplasm and normal tissue. Glomus tumours are described as slightly hypointensive to slightly hyperintensive on a T1-weighted image, and hyperintensive on a T2-weighted image. The T1-weighted image after injection of gadolinium shows a stronger enhancement, and the lesion can be seen more clearly. It is essential to highlight disruptions of the capsule and areas of enhancement beside the main tumour. Ultrasonography can be a better option than MRI, considering the time required for the test, its cost and its ability to enable the evaluation of lesions dynamically in realtime.[12]

Solitary glomus tumours need to be ruled out from painful tumours, such as leiomyoma or eccrinespiradenoma, cavernous hemangioma and blue rubber-bleb nevus syndrome.

Histopathologically, glomus tumours consist of glomus cells, blood vessels, and smooth muscles. Glomus tumours are categorised into three types by the composition of these components: glomangiomas are mainly made up of the vessels; solid glomus tumours are chiefly composed of glomus cells; and glomangiomyomas show a predominance of smooth muscles. Although glomus tumours are essentially benign, sarcomas accompany benign glomus tumours in rare cases to form glomangiosarcoma.[13]

The anatomical location of the glomus tumour under the nail can be in the nail bed or in the nail matrix, which can have an effect on the outcome after any surgical procedure done (Figure-1). The current study was planned to determine the clinical outcome of patients with glomus tumour in nail matrix and nail bed that were excised with transungual approach.

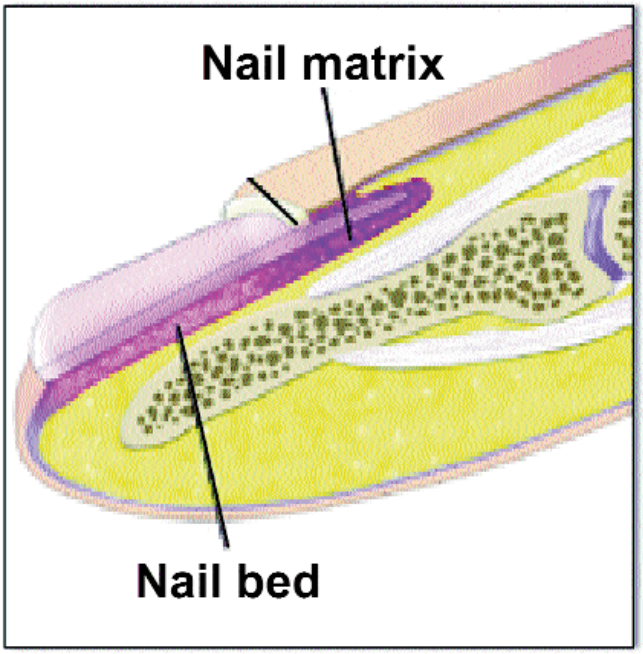

Figure-1: Anatomy of nail showing nail matrix.

Patients and Methods

The case series was conducted at the Allied and District Headquarter Hospital, Faisalabad, Pakistan, from January 2012 to June 2014, and comprised patients with glomus tumour at finger tips whose diagnosis was confirmed with biopsy results. All of them were admitted with major complaint of pain at the finger tips.

Variables noted included the location of the tumour in the nail i.e. either nail matrix or the nail bed.

Excision was done using transungual approach in which the nails were removed and an excision was made on the ventral surface of the nail bed where the tumours were present.

Data was analysed using SPSS 17. Quantitative data like age was presented in the form of mean ± standard deviation (SD). Qualitative data like gender was presented as frequency and percentage.

Results

Of the 8 patients, 6(75%) were female and 2(25%) were males; male-to-female ratio being 1:3 (Table-1).

Age at presentation ranged from 19 years to 43 years, with a mean of 32.5±6.95 years among the females and

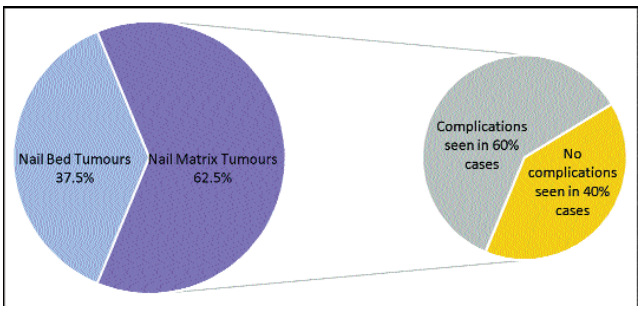

Figure-2: Complication rates in Glomustumour based on anatomical location after surgical excision.

40±2.34 years for males. Six (75%) patients had glomus tumour involving the non-dominant hand, with 2(2%) female patients having involvement of the dominant right hand (Table-2).

Among the digits involved, 3(37.5%) patients had lesion on the fourth (ring) digit; 3(37.5%) had involvement of the middle digit; and 2(25%) had thumb involvement. The duration of complaints at presentation ranged from 1 to 24 months, with a mean of 8.7±2.42 months.

In all cases, the pain was caused by pressure, but in 2(25%) cases, the pain occurred as cold intolerance. One (12.5%) case was recurrent after undergoing surgical treatment in some other hospital. One (12.5%) case demonstrated nail deformity. All of the patients had a solitary glomus tumour in one digit.

Five (62.5%) patients had tumours located in the nail matrix and 3(37.5%) in the nail bed (Table-3).

Table-1: Gender Distribution.

Sex	Frequency	Percentage
Male	2	25%
Female	6	75%
	Male to female ration 1:3	

Table-2: Distribution of GlomusTumour among dominant and non-dominant hand.

Hand	Cases	Percentage
Dominant Hand	2	25%
Non-Dominant Hand	6	75%

Table-3: Distribution of GlomusTumour in nail matrix and nail bed.

Location of GlomusTumour in Hand	Cases	Percentage
Nail bed	3	37.5%
Nail Matrix	5	62.5%

Three (37.5%) patients showed abnormal findings, including bone erosion. Ultrasonography, CT and MRI were additionally performed in 2(25%) cases where no pain was induced by the ice cube test or no abnormal findings were discovered in the simple X-ray test. All patients underwent excision using transungual approach. No recurrence was observed after a mean follow-up of 14.5±3.56 months.

Three (60%) patients with nail matrix tumourhad prolonged pain sensation, whereas none among those with nail bed lesion had prolonged pain sensation (Figure-2).

Discussion

In treating glomus tumours, a complete surgical excision is known to be the best way to relieve pain and prevent recurrence. In performing operations, removal in a bloodless field with tourniquet application is necessary. Total extirpation is performed after carefully avulsing the surrounding tissues of the tumours. In cases where the operation field is not clear due to haemorrhage, total extirpation of the tumours is often impossible and the recurrence of tumours is highly likely. If the tumours have penetrated into the bones, bone curettage or partial excision is performed. Unless there is a malignant finding, en bloc resection is not necessary. A common choice for tumours located under the nail bed and nail matrix is a transungual approach. In this method, the nails are removed, and an excision is made on the ventral surface of the nail bed where the tumours are present in order to remove the tumours. Although this approach is advantageous in offering a good field of view, it can yield cosmetically unsatisfying results if the nail bed is severely damaged while removing tumours or if sutures of the nail bed are made without care, causing postoperative nail deformity.[14]

In an attempt to avoid such nail deformity, an approach to removing tumours by elevating a flap under the periosteum through a lateral incision of the nail bed has been introduced. However, application of the method can be limited by the location of tumours and the procedure is complicated. Moreover, the technique can sometimes damage digital nerves. Another approach to preventing a nail deformity has been suggested: A U-shaped incision is made to the upper nail where a tumour is located. Then, a Greenstick fracture is made on the nail bed to partially open it in a trapdoor shape. That way the nail bed where the tumour exists is exposed. Through such an approach, the nail bed is maintained flat until new nails grow and nail deformities can be prevented.[15]

We used the transungual approach in all our patients, as it

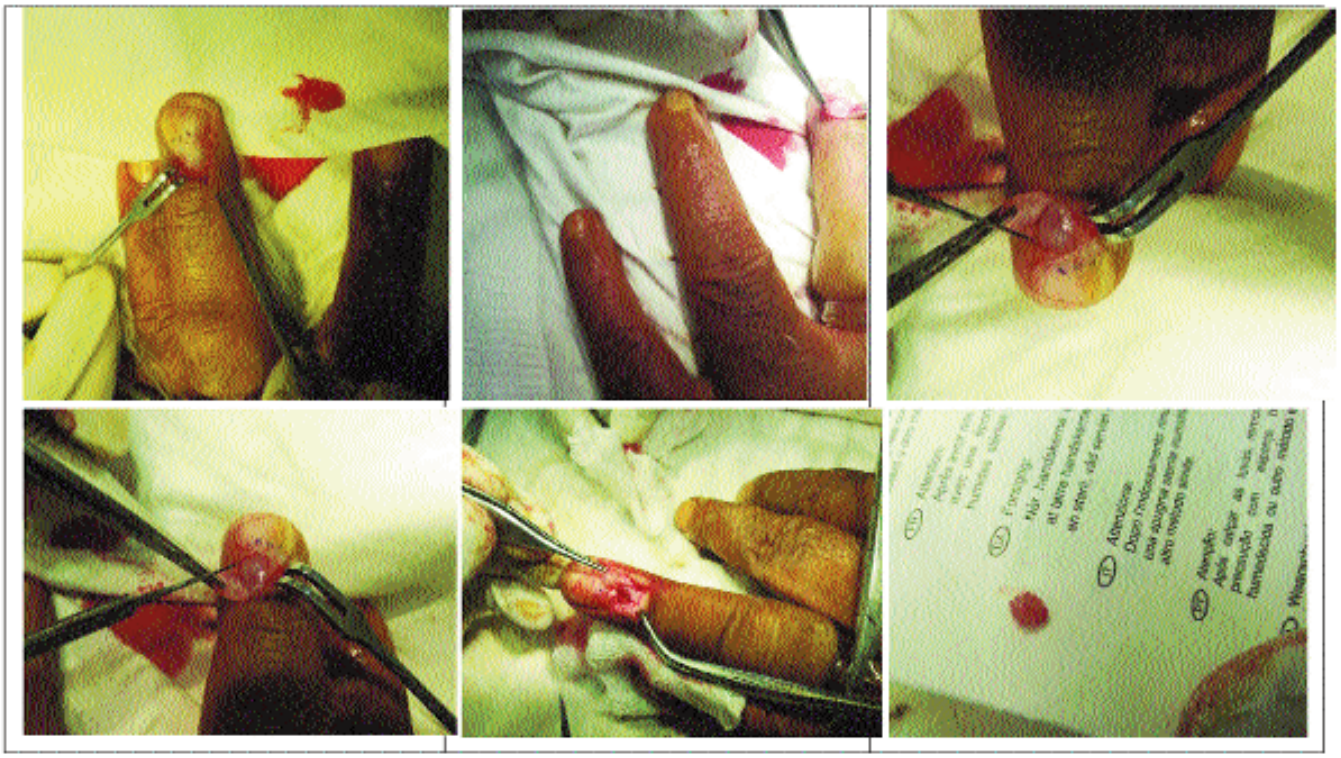

Figure-3: Steps of GlomusTumour Excision.

provides a better view of the whole subungual region and makes precise and complete excision possible. It is also useful when the exact location is not known beforehand (Figure-3).

The postoperative recurrence of tumours in a localised area is usually caused by the incomplete removal of the tumours, but may also signify multiple glomus tumours. Therefore, meticulous care needs to be given at the first operation to completely remove all lesions. To prevent incomplete excision, a good view needs to be ensured in removal as well. Performing curettage additionally in order to remove remaining tissues after the excision is also useful.[16-18]

Conclusion

After excision using transangual approach and careful record-keeping it was seen that there was no recurrence and that the anatomic location of the subungual glomus tumour at initial presentation can predict postoperative prolonged pain.

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