

Subungual Ganglion Cyst Mimicking Glomus Tumor

Gyeong Hyeon Doh, Bum Sik Kim, HeaKyeong Shin, Kyung Chan Ahn, Ki Yong Hong, Yea Sik Han, SuRak Eo

Department of Plastic and Reconstructive Surgery, Dongguk University Ilsan Hospital, Dongguk University School of Medicine, Seoul, Korea

Subungual masses accompanying nail deformity are of common occurrence and uniquely confirmed by histopathologic examination postoperatively. Although glomus tumor is most frequently diagnosed with its specific clinical triad, other rarer diagnoses have also been reported. Though ganglion cysts are predominantly found around the distal phalangeal joint as a mucous cyst and myxoid cyst, they might also appear as a subungual mass accompanied by nail deformity thereby mimicking the glomus tumor. A 54-year-old woman visited our outpatient clinic with nail deformity and pain on the tip of the right thumb. She had a history of nail root injury on her right thumb which occurred 3 months back at a nail shop. Physical examination revealed a convex point with tenderness on the right thumbnail. Doppler ultrasonography revealed the presence of 0.43×0.26×0.53 cm³ sized non-specific cystic lesion with hypoechogenicity and no abnormal vascularity. Complete excision of the cyst was performed and histopathology revealed a ganglion cyst. Subungual ganglion cyst is rarely occurred and known to be usually asymptomatic. Herein, we report a case of ganglion cyst of subungual area which was mistakenly diagnosed as a glomus tumor preoperatively.

Keywords: Ganglion cyst, Glomus tumor, Subungual tumor

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Corresponding author:

SuRak Eo

Department of Plastic and Reconstructive Surgery, Dongguk University Ilsan Hospital, Dongguk University School of Medicine, 27 Dongguk-ro, Ilsandong-gu, Goyang 10326, Korea

Tel: +82-31-961-7342

Fax: +82-31-961-7347

E-mail: u9998185@yahoo.com

ORCID:

<https://orcid.org/0000-0002-4221-2613>

INTRODUCTION

Space occupying lesion at the subungual area is commonly diagnosed as a glomus tumor which accounts for 1%–5% of soft tissue tumors of the hand and 75% of glomus tumors are subungual [1,2]. The clinical triad of point tenderness, intermittent severe pain, and cold hypersensitivity accounts for preoperative easy diagnosis. However, ganglion cyst at the distal phalangeal joint which is known as mucous cyst occasionally grows up infrequently into the subungual area and mimics the clinical course of the glomus tumor [3,4]. Although cold intolerance is unique in glomus tumor, nail deformities and sharp tenderness are frequently accompanied in both the cases. The authors encountered a subungual ganglion cyst, which was erroneously diagnosed preoperatively for glomus tumor and compared both the lesions systemically with the literature review.

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CASE REPORT

A 54-year-old woman visited our outpatient clinic with nail deformity and pain at the tip of the right thumb. She underwent mild injury on her nail root of right thumb at a nail shop 3 months back. Subsequently, nail deformity aggravated gradually. Physical examination revealed a convex point with tenderness on the right thumbnail. The nail revealed proximal ridging and elevation of the nail plate accompanying the V-shaped notch without nail destruction (Fig. 1). Cold hypersensitivity was denied and ice cube test was negative. However, a soft tissue tumor was suspected at the subungual area, which occurs most commonly in glomus tumors and other possible space-occupying lesions. Osteophyte of distal interphalangeal (DIP) joint was found on X-ray examination (Fig. 2A). On Doppler ultrasonography, a $0.43 \times 0.26 \times 0.53 \text{ cm}^3$ sized non-specific cystic lesion with hypoechoogenicity and no abnormal vascularity was observed (Fig. 3). Under digital nerve block of the thumb, the thumb nail was extracted with bilateral incision at the level of eponychium to expose the cyst which was placed at the subungual area. During surgery, revealed subungual area cyst had thin wall and contained clear mucinous fluid of jelly-like consistency (Fig. 4). Examination revealed $0.5 \times 0.5 \text{ cm}^2$, whitish, and round shaped cyst after complete excision of the lesion (Fig. 5),



Fig. 1. Preoperative photograph on right thumbnail with deformity.

which was unlike the glomus tumor. The incised portion of the nail bed was loosely re-approximated with 7-0 Vicryl and the nail plate was replaced and sutured in place. For removal of osteophyte, additional incision was added along the radial side of thumb to the interphalangeal joint level, and then burring was performed at proximal and distal phalanx at interphalangeal joint level. Since the osteophyte was placed partially under the insertion site of extensor tendon, minimal injury of radial side of the extensor tendon was inevitable. Pathologically, tissue biopsy revealed a ganglion cyst (Fig. 6). Seventeen days later, total stitch out was done without any complications on her right thumb. Following surgical treatment, there was no recurrence but deformed nail appearance and scar on the radial side of the thumb were noted during the follow-up of 2 years (Fig. 7).

Written informed consents were obtained.



Fig. 2. Osteophyte of interphalangeal joint of the right thumb. (A) X-ray before removal of osteophyte. (B) X-ray after removal of osteophyte.



Fig. 3. Preoperative ultrasonographic findings.



Fig. 4. (A, B) Intraoperative photographs of a whitish, irregular, jelly-like round soft tissue mass on the right thumbnail bed.



Fig. 5. Postoperative photograph of 5x5 mm² sized ganglion cyst.

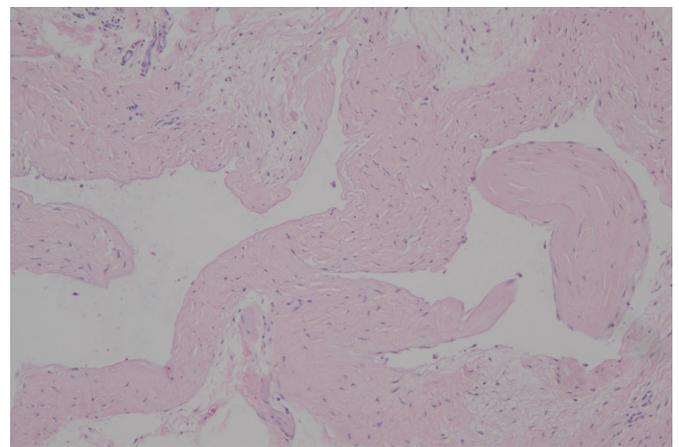


Fig. 6. Pathologic findings of soft tissue mass isolated from the right thumbnail bed. Microscopic finding reveals multiseptated thin walled cystic lesion containing clear, mucinous fluid. The walls are composed of dense fibrous tissue with no specialized lining cells. These findings are very consistent with ganglion cyst (H&E ×100).

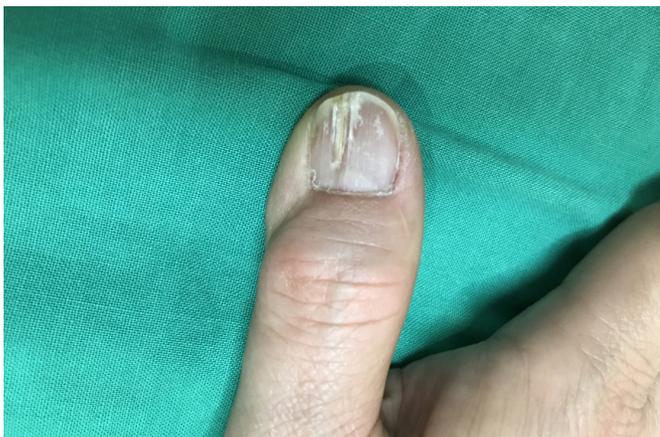


Fig. 7. Postoperative photograph on right thumbnail with deformity after 2 years.

DISCUSSION

A variety of subungual masses have been diagnosed as a myxoid cyst [3], hemangioma [5], fibroma [5], neurofibroma [5], neuroma [6], schwannoma [6], keratoacanthoma [6], ony-

chomatricoma [6], squamous cell carcinoma [6], and malignant melanoma [6]. Among them, malignant tumors are seldom truly subungual and easily differentiated from benign tumors based on external appearances. Ulceration through the nail, bluish color change, and destruction of the adjacent tissues raised the possibility of the malignancy. However, clinical manifestation of the subungual mass is often non-specific, and accurate diagnosis is always dependent on postoperative histopathologic examination.

Subungual ganglion cysts (SGC) affecting only the nail shape are distinctly unusual and difficult to diagnose, as they are unlikely to display mucoid discharge [3,4]. Although de Berker et al. [3] reported large series of SGCs exhibiting red lunula, al-

tered transverse nail curvature, and variable nail destruction, many of them seemed to accompany the external distortion around the DIP joint. Consequently, subungual mass is usually considered to be the glomus tumor with its predominant occurrence at its specific location under the nail. Furthermore, the authors esteemed the present case as a glomus tumor based on physical examination accompanied by pain and blunt tenderness while cold intolerance was not eminent.

SGC has somewhat different clinical features from that of the mucoid cyst arising from the DIP joint which usually accompanies definitive erythematous swelling and ulceration at the dorsum of the DIP joint [7]. Contrary to the glomus tumor, in the present case, X-ray revealed osteophyte at the interphalangeal joint preoperatively (Fig. 2) and focal hypoechoic masses on the ultrasonogram, thereby suggesting subungual mucinous lesions (Fig. 3).

Ultrasonographic characteristics of cystic, echogenicity and vascularity are helpful for the differentiation of subungual tumors [5]. Hemangioma shows well-defined and hypoechoic mass and pyogenic granuloma reveals more echogenicity with small hypoechoic foci. In case of subungual epidermal cyst [7], hypoechoic or anechoic subungual masses with variable echogenic foci are noted. However, differentiating them is always not possible solely based on ultrasonographic characteristics due to non-specific findings [5]. Magnetic resonance imaging is an excellent imaging modality for detecting small subungual mass as small as 0.2 cm [8]. SGC reveals a hyperintense mass on T2-weighted imaging with well-defined margins and typically a non-enhancing center with higher specificity.

SGC is variously named as a subungual myxoid cyst, digital mucous cyst, mucinous cyst, myxomatous degeneration cyst, and epidermal cyst [7]. It represents ganglia of the adjacent DIP joint, which originates due to leakage of the fluid from the joint into the surrounding tissues. Osteophytes and degenerated, rough articular surfaces may lead to inciting damage to the joint capsule. A fluid-filled stalk may or may not be seen connecting ganglion cyst to the adjacent joint [9]. However, Tomoda et al. [10] reported the case of ulcerating subungual myxoid cyst, caused by overproduction of mucopolysaccharides and differentiated it from the SGC based on lack of connections with joint sacs.

Considering that the subungual space is a very thin area with 0.1-0.2 cm thickness and rich in glomus bodies and blood vessels with compact innervation, bony erosions are also very common with its pressure effect. Within the limited submatrix space, proximal upward pressure from the subungual mass and the tethering downward force of the lateral proximal attach-

ments of the matrix can cause various nail deformities [11].

Space occupying lesion under the nail matrix could affect its microvasculature resulting in various nail deformities based on the degree of distortion of the nail matrix [7]. Color of the lunula, nail curvature, and nail integrity might change and reveal ridge, distal split, and superficial longitudinal split. Brown et al. [7] traced long-term nail change and growth patterns subsequent to various treatments. They surgically approached with T- or H-incisions to expose the DIP joint. However, in the present case, nail was removed with the standard subungual approach. Surgical excision is the typical existing treatment and removal of the osteophyte from the region of the DIP joint as well as the cyst is imperative [3].

We propose that hand surgeons should perform differential diagnosis of subungual masses including SGC with reference to symptoms and appropriate diagnostic imaging studies preoperatively, though usual consideration of subungual mass as a glomus tumor. We believe that present findings will aid in precise excising with an aim to reduce the chances of recurrence of SGC. Excision of whole ganglion including the cysts which originate from ligament and segment of joint capsule reduces the recurrence.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

REFERENCES

1. Morey VM, Garg B, Kotwal PP. Glomus tumours of the hand: review of literature. *J Clin Orthop Trauma*. 2016;7:286-91.
2. Chiang YP, Hsu CY, Lien WC, Chang YJ. Ultrasonographic appearance of subungual glomus tumors. *J Clin Ultrasound*. 2014;42:336-40.
3. de Berker D, Goettman S, Baran R. Subungual myxoid cysts: clinical manifestations and response to therapy. *J Am Acad Dermatol*. 2002;46:394-8.
4. Dooley TP, Kindt KE, Baratz ME. Subungual tumors. *Hand (N Y)*. 2012;7:252-8.
5. Willard KJ, Cappel MA, Kozin SH, Abzug JM. Benign subungual tumors. *J Hand Surg Am*. 2012;37:1276-86.
6. Whitehouse HJ, Urwin R, Stables G. Traumatic subungual neuroma. *Clin Exp Dermatol*. 2018;43:65-6.
7. Brown RE, Zook EG, Russell RC, Kucan JO, Smoot EC. Fingernail deformities secondary to ganglions of the distal interphalangeal joint (mucous cysts). *Plast Reconstr Surg*. 1991; 87:718-25.

8. Ham KW, Yun IS, Tark KC. Glomus tumors: symptom variations and magnetic resonance imaging for diagnosis. *Arch Plast Surg*. 2013;40:392-6.
9. Giard MC, Pineda C. Ganglion cyst versus synovial cyst? Ultrasound characteristics through a review of the literature. *Rheumatol Int*. 2015;35:597-605.
10. Tomoda T, Ono T, Ohyama K, Kojo Y. Subungual myxoid cyst producing an ulcer in the nail plate. *J Dermatol*. 1982;9:451-4.
11. Guero S, Guichard S, Fraitag SR. Ligamentary structure of the base of the nail. *Surg Radiol Anat*. 1994;16:47-52.

사구체종양으로 오인된 조갑하 결절종

도경현, 김범식, 신혜경, 안경찬, 홍기용, 한예식, 어수락

동국대학교의과대학 동국대학교 일산병원 성형외과

손발톱 변형을 동반한 조갑하 덩어리는 흔히 발생하며 수술 후 병리조직학적 검사에 의해 유일하게 확인된다. 사구체종양(glomus tumor)은 특정 임상적 세징후로 가장 빈번하게 진단되지만 다른 드문 종양으로의 진단도 보고된다. 결절종(ganglion cyst)은 주로 원위지 골간관절 주위에서 점액 낭종 및 점액성 낭종으로 발견되지만, 손톱 기형을 동반한 조갑하 덩어리로도 나타날 수 있어 사구체종양으로 오인될 수 있다. 저자들은 54세 여성의 우측 엄지손가락 원위지부에서 손톱 기형과 통증으로 수술 전 사구체종양으로 진단 결정되었던 조갑하 결절종 1예를 경험하고 보고 한다.

색인단어: 결절종, 사구체종양, 조갑하 종양

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교신저자 어수락

10326, 경기도 고양시 일산동구 동국로 27, 동국대학교의과대학 동국대학교 일산병원 성형외과

TEL 031-961-7342 **FAX** 031-961-7347 **E-mail** u9998185@yahoo.com

ORCID <https://orcid.org/0000-0002-4221-2613>