Kobe J. Med. Sci., Vol. 62, No. 1, pp. E19-E21, 2016

Recurrence of Enchondroma in a Middle Finger after Curettage and Back-filling with Calcium Phosphate Bone Cement: a Case Report

ISSEI NAGURA[1*], TAKAKO KANATANI[1], MASATOSHI SUMI[1], TAKESHI KOKUBU[2] and MASAHIRO KUROSAKA[2]

[1] *Department of Orthopaedic Surgery, Kobe Rosai Hospital, 4-1-23 Kagoike-dori, Chuo-ku, Kobe, 651-0053, Japan*

[2]*Department of Orthopaedic Surgery, Kobe University Graduate School of Medicine, 7-5-1 Kusunoki-cho, Chuo-ku, Kobe, 650-0017, Japan*

**Corresponding author*

Received 7 January 2016/ Accepted 16 February 2016

Key Words: enchondroma, recurrence, calcium phosphate bone cement

We report a case of recurrence of enchondroma in a middle finger after curettage and back-filling with calcium phosphate bone cement (CPC). The radiograph showed a lytic lesion around the CPC filling which showed no signs of absorption after 12 years. The tumor was curated easily, however, a steel bar was needed to remove the CPC mass in a carefully manner not to break the cortex. CPC has an advantage of immediate biomechanical stability, on the other hand, a disadvantage of being unabsorbed inside of bone. Although enchondroma has a low recurrence rate after surgery generally, in consideration of recurrence, we recommend the use of absorbable materials when a use of artificial bone substitute to fill the defect is planned.

INTRODUCTION

In treating enchondromas of the hand, the ultimate goal is to remove the tumor completely and prevent bone fracture after curettage. Generally large or symptomatic enchondroma should be treated by curettage and the cavity can be left empty or filled with autograft, allograft, or artificial bone substitute[1-4]. To avoid the risk of fracture if the cavity is not grafted, calcium phosphate bone cement (CPC) can be used to treat enchondroma of the hand. Joosten et al. reported 8 patients with enchondroma who were treated with CPC grafting[5] and Yasuda et al. reported ten patients with enchondroma who were treated with CPC filling[6]. However, their reports did not present or discuss recurrence cases in a long-term follow-up period even though the risk of local recurrence following curettage was 4.5 %[7]. We report a recurrence case of enchondroma in a middle proximal phalanx treated by curettage of the lesion and CPC back-filled twelve years ago.

CLINICAL CASE

A 41 year-old woman who had enchondroma in her right middle proximal phalanx twelve years ago presented with a recurrence of the tumor, noticed coincidentally when she was X-rayed during consultation for carpal tunnel syndrome. Her previous treatment had been curettage followed by back-filling with CPC (Biopex®, PENTAX, Tokyo, Japan). At the referral visit to our hospital, the radiograph showed a well-demarcated lytic lesion of the middle proximal phalanx. The patient had no related symptoms and the CPC filling showed no signs of absorption even after 12 years (Figure 1a). Magnetic Resonance Imaging (MRI) with the intermediate intensity lesion in T1 weighted imaging and the high intensity lesion in T2 weighted imaging the tumor lesion supported the recurrence of enchodroma (Figure 1b, c).

Under general anesthesia, a small cortical window directly above the tumor was created and complete removal of the tumor after curettage was carried out under the fluoroscopic control. The excised tissue confirmed clinical diagnosis of enchondroma from its typical macroscopic findings of contents. Following this, the CPC mass was removed to reduce the risk of having remaining enchondroma cells by steel burr abrasion with careful attention so as not to damage the cortex. Then complete curettage was confirmed visually and fluoroscopically. Instead of artificial substitute, iliac crest bone grafting was performed to remediate the defect to prevent postoperative fracture[8], because this was a recurrence case after filling with CPC (Figure 2a). Later pathological analysis confirmed the tumor was enchodroma without malignant transformation. The bone grafting was identified on MRI with the high intensity lesion in T1 weighted imaging and the low intensity lesion in T2 weighted imaging at one year postoperatively (Figure 2b, c).

Phone: +81-78-231-5901 Fax: +81-78-242-5316 E-mail: surf-trip@ams.odn.ne.jp

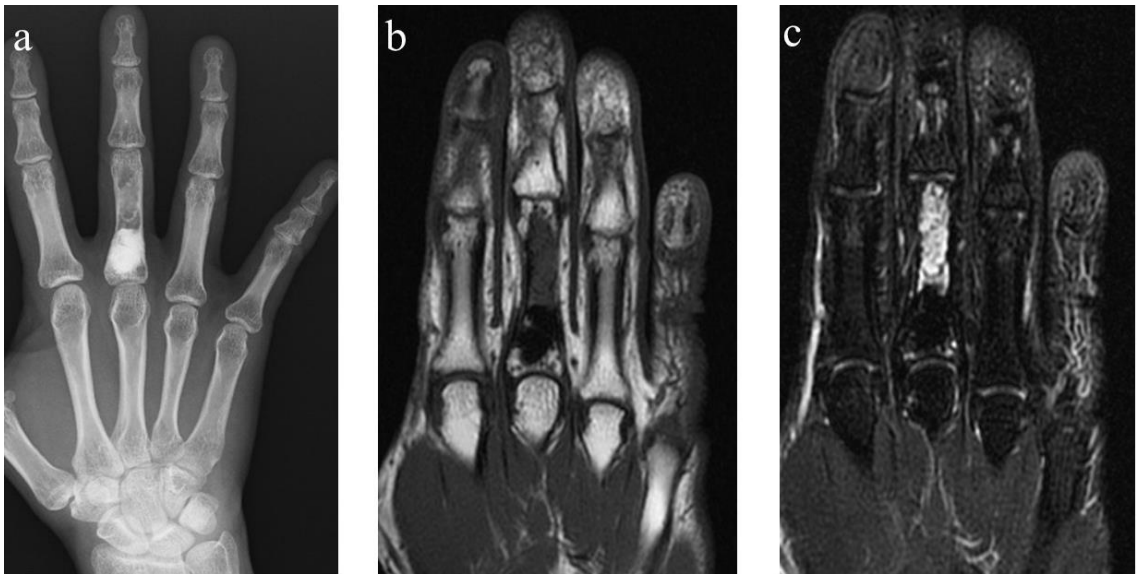

Figure 1. A-P radiograph (a) and MRI (b; T1 weighted image and c; T2 weighted image) at the referral visit to our hospital

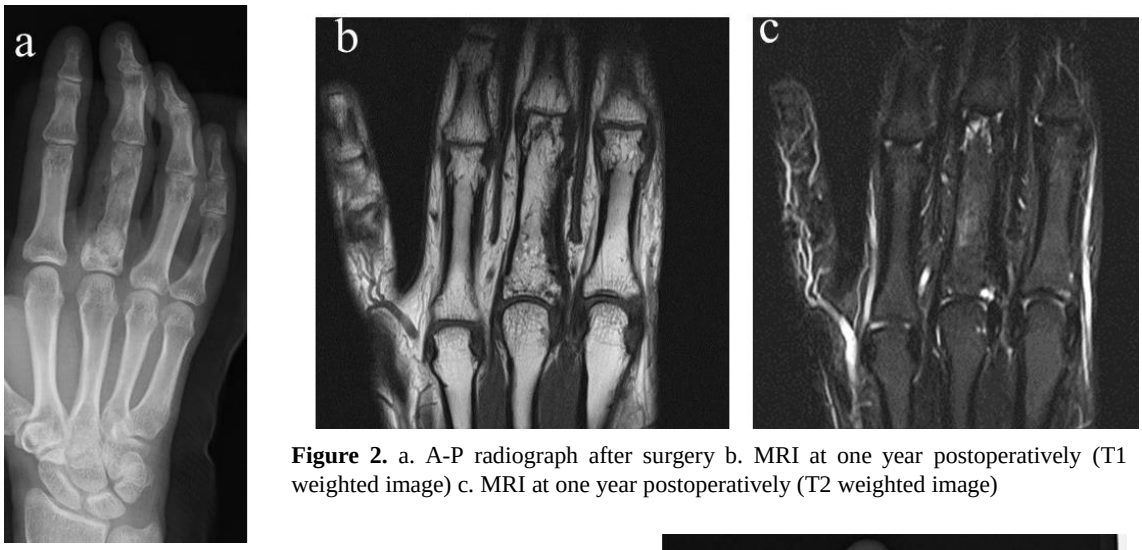

Figure 2. a. A-P radiograph after surgery b. MRI at one year postoperatively (T1 weighted image) c. MRI at one year postoperatively (T2 weighted image)

The section of the grafted bone area was completely same intensity of native bone. The patient's postoperative course was uneventful after a follow up period of two years after surgery (Figure 3).

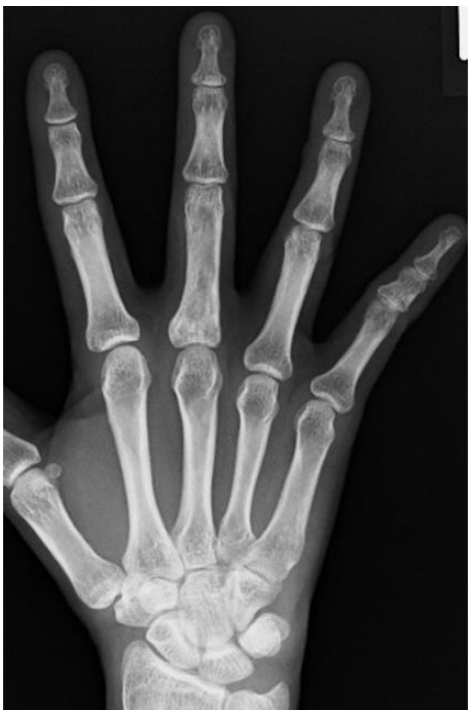

Figure 3. A-P radiograph at two years postoperatively

DISCUSSION

Among the benign bone tumors in the hand, enchondroma is the most common. When curettage is performed, cavity is not grafted or followed by bone grafting or the use of an artificial bone substitute. There has been some debate about the most suitable protocol as all procedures have demonstrated favorable results but exhibit different advantages[7]. Also it was found that grafting did not affect the healing result, time taken to heal, joint stiffness, or the recurrence rate[9].

CPC is easily injectable and has the advantage of more easily filling in irregularly shaped cavities[6]. Further it has the merits of eliminating donor-site morbidity and delivering immediate biomechanical stability, and was widely used in early 2000s[5, 6]. On the other hand, there is a disadvantage of remaining inside of bone without being totally absorbed. Yasuda et al reported only two of ten phalangeal enchondroma cases presented partial absorption of CPC at an average of 41 months follow-up period and difficulty of corrective osteotomy for malunion in a case with CPC[6].

Since the incidence of local recurrence after curettage was found to be 4.5%[7], surgeons might encounter the recurrent enchondroma initially treated with the inclusion of CPC. We found it was possible to remove CPC by steel burr abrasion, however, to avoid the risk of damaging the cortex in a second surgical procedure, we recommend the use of absorbable materials, for example Beta-tricalcium phosphate (β-TCP)[10], if treatment is by way of curettage accompanied by artificial bone substrate substitute.

REFERENCES

1. **Tordai, P., Hoglund, M., and Lugnegard, H.** 1990. Is the treatment of enchondroma in the hand by simple curettage a rewarding method? J Hand Surg Br **15**: 331-334.
2. **Yercan, H., Özalp, T., Coskunol, E., and Özemir, O.** 2004. Long –term results of autograft and allograft application in hand enchondromas. Acta Orthop Traumatol Turc **38**: 337-342.
3. **Bauer, R.D., Lewis, M.M., and Ponser, M.A.** 1988. Treatment of enchondromas of the hand with allograft bone. J Hand Surg Am **13**: 908-916.
4. **Gaasbeek, R.D., Rijinberg, W.J., van Loon, C.J., Meyers, H., and Feith, R.** 2005. No local recurrence of enchondroma after curettage and plaster filling. Arch Orthop Trauma Surg **125**: 42-45.
5. **Joosten, U., Joist, A., Frebel, T., Walter, M., and Langer, M.** 2000. The use of an in situ curing hydroxyapatite cement as an alternative to bone graft following removal of enchondroma of the hand. J Hand Surg Br **25**: 288-291.
6. **Yasuda, M., Masada, K., and Takeuchi, E.** 2006. Treatment of enchondroma of the hand with injectable calcium phosphate bone cement. J Hand Surg Am **31**: 98-102.
7. **Wolfe, S.W., Hotchkiss, R.N., Pederson, W.C., and Kozin, S.H.** 2010. Green's operative hand surgery, 6th Edn, Philadelphia, Churchill Livingstone. **2**: 2176-2178.
8. **Gaulke, R., and Suppelna, G.** 2004. Solitary enchondroma at the hand. Long-term follow up study after operative treatment. J Hand Surg Br **29**: 64-66.
9. **Sassoon, A.A., Fitz-Gibbon, P.D., Harmsen, W.S., and Moran, S.L.** 2012. Enchodromas of the hand: factors affecting recurrence, healing, motion, and malignant transformation. J Hand Surg Am **37**: 1229-1234.
10. **Reppenhagen, S., Reichert, J.C., Rackwitz, L., Rudert, M., Raab, P., Daculsi, G., and NÖth, U.** 2012. Biphasic bone substitute and fibrin sealant for treatment of benign tumors and tumor-like lesions. Int Orthop **36**: 139-14.