GIANT CELL TUMOR OF THE LOWER END OF THE RADIUS

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Abstract- - Five cases of giant cell tumor of the lower end of radius are reported. Three of the patients were women and two were men, the youngest of the patients was 18 years old and oldest 37 years. En bloc resection followed by reconstructive procedures were performed in three of the cases with good results.

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Key Words: Giant Cell Tumor, radius

INTRODUCTION

Giant cell tumor (GCT) is a benign but potentially aggressive locally destructive neoplasm that develops within bone. The origin of this tumor is unknown. Typically the lesion develops in the region of the epiphysis of long bones after closure of the growth plate It extends by growth into the metaphyseal area (1-6). The majority of giant cell tumors develop in the lower end of the femur, the upper end of the tibia and the lower end of the radius. The tumor is most common in young adults with highest incidence in the third decade. and tumor may extend to the joint cartilage, but usually not beyond (7).

Numerous bone tumors have giant cells that must be distinguished from conventional GCT (8). These range from benign lesions such as the nonossifying fibroma, to locally aggressive lesions like the aneurysmal bone cyst and high-grade sarcomas which are disguised by masses of reactive osteoclast-like giant cells such as the benign giant-cell rich variant of osteosarcoma. The GCT of hyperparathyroidism is histologically indistinguishable from the GCT of epiphysis (9), the former lesion is most frequently centered within either the diaphysis or metaphysis and is associated with elevated serum calcium and depressed serum phosphorus incidence, about 5% of primary bone tumors (6). Seventy percent of patients are 20 to 40 years of age. It is rarely seen in patients with open growth plates (10).

Clinical features include pain, swelling and occasionally pathologic fractures. Characteristically, the GCT is centered in the epiphysis (99%) and has characteristically the GCT is centered in the epiphysis (99%) and has pure lysis with or without a trabeculated appearance.

Approximately 10 percent of benign giant cell tumors undergo malignant transformation (11). The majority of malignant GCT's are fibrosarcoma, a few are osteosarcoma (12).

Case 1

A 25 year old woman with GCT of distal radius (Fig. 1):

Pathology

Gross appearance : The specimen consists of irregular grayish brown pieces of tissue measuring 5 × 3 cm in size. The consistently is soft.

Microscopic: Section shows the features of a cellular neoplastic tissue composed of mononuclear spindle, ovoid or round stromal cells among which lie many multinucleated giant cells. The mitoses are rare. Foci of necrosis and hemosiderin deposition are seen.

Diagnosis

GCT of bone-lower end of the radius. As the lesion occupied less than 50 percent of the distal radius and had not invaded the cortex, the standard treatment of GCT was performed (curettage and bone grafting).

Case 2

A 32 year old man complaining of pain, swelling and tenderness of the lower end of the right radius. Standard treatment of GCT was performed three years earlier (curettage and bone grafting), good results. Recurrence following treatment for GCT usually occurs within three years (Fig. 2).

Case 3

A 18 year old girl complaining of pain, swelling and tenderness of the right distal radius following treatment for GCT (Curettage and bone grafting) (Fig. 3).

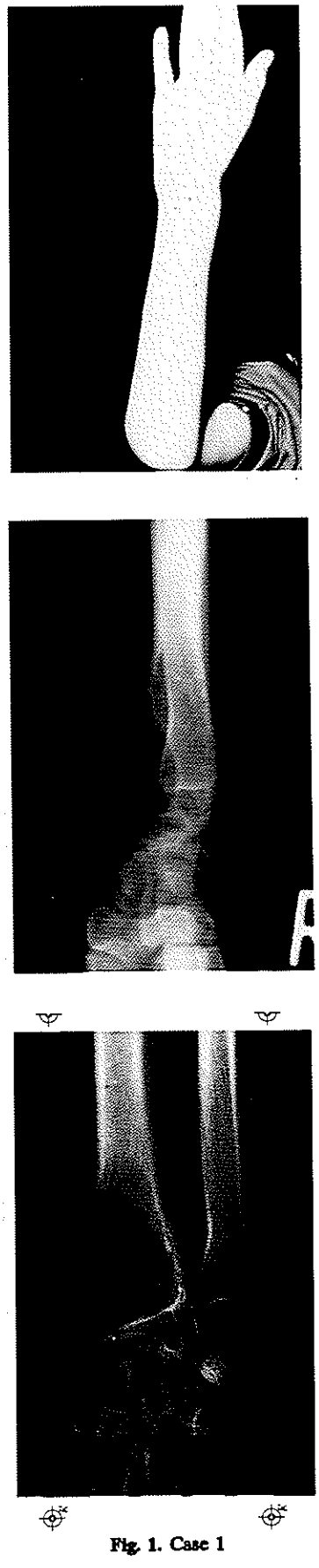

Fig. 1. Case 1

Diagnosis : Recurrence.
Treatment : Resection and proximal fibular autograft.

Case 4

A 37 year old man complaining of pain, swelling and tenderness of the lower end of the radius.

Radiography was most consistent with a GCT of distal radius, because GCT of this patient was considered highly aggressive. Therefors, en bloc resection and proximal fibular autograft was performed, with favorable results (Fig. 4).

Resection of Distal Radius and substitution by Fibular Transplant

Technique

A 10 cm volar incision was made, over the distal third of the radius to expose the capsule of the tumor and the radial shaft; the shaft was divided with a bone saw 2.5 cm above the tumor. The proximal end of the distal fragment was grasped with a bone-holding forceps 41and removed along with the tumor and the periosteum. All soft tissue was removed from the transplant. A flat surface of 5 cm on the medial side of its distal end; a similar surface on the lateral side of the radius. The transplant was inserted so that its raw surface apposed that of the radius, the apex of its head replaced the radial styloid, and its articular cartilage on the anteromedial aspect of its head articulates with the scaphoid. The transplant was attached to the radius with screws. A Kirschner wire was used to stabilize the carpus on the end of the trasplant (13).

AFTER TREATMENT : A long arm cast is applied with the elbow at 90 degrees and the forearm in neutral rotation. At 8 to 12 weeks the cast was replaced by an orthosis with a movable joint at the elbow; the orthosis was worn from 3 to 6 months. When union between the transplant and the radius was solid enough, exercises of the wrist and elbow were begun, but the orthosis was worn between exercises until the graft was incorporated into the radius.

Case 5

A 33 year old woman with a neglected GCT with massive soft tissue extension.

In this case amputation was indicated (Fig. 5).

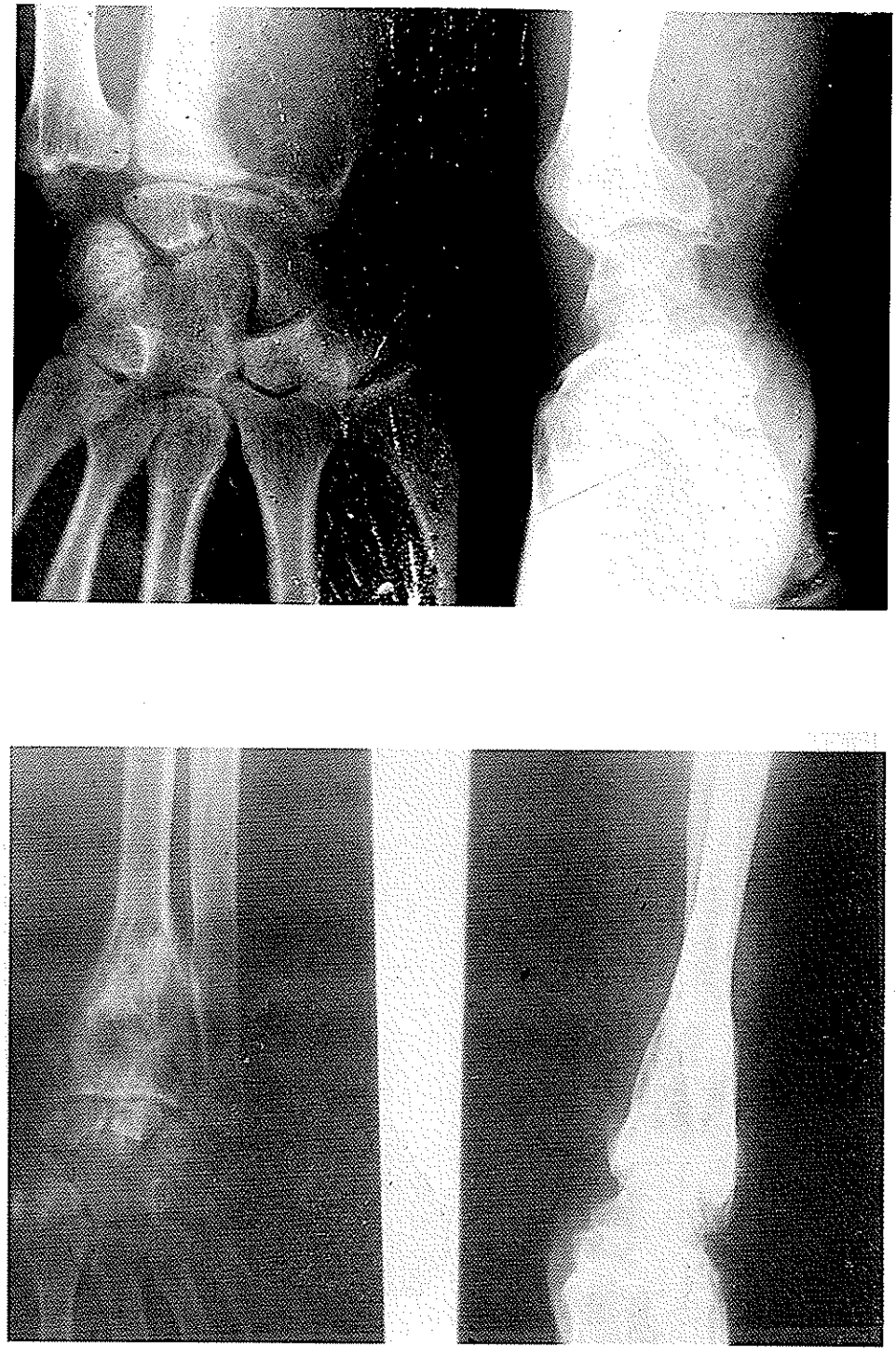

Fig. 2. (a) Before curettage (b) 8 months after curettage and bone grafting

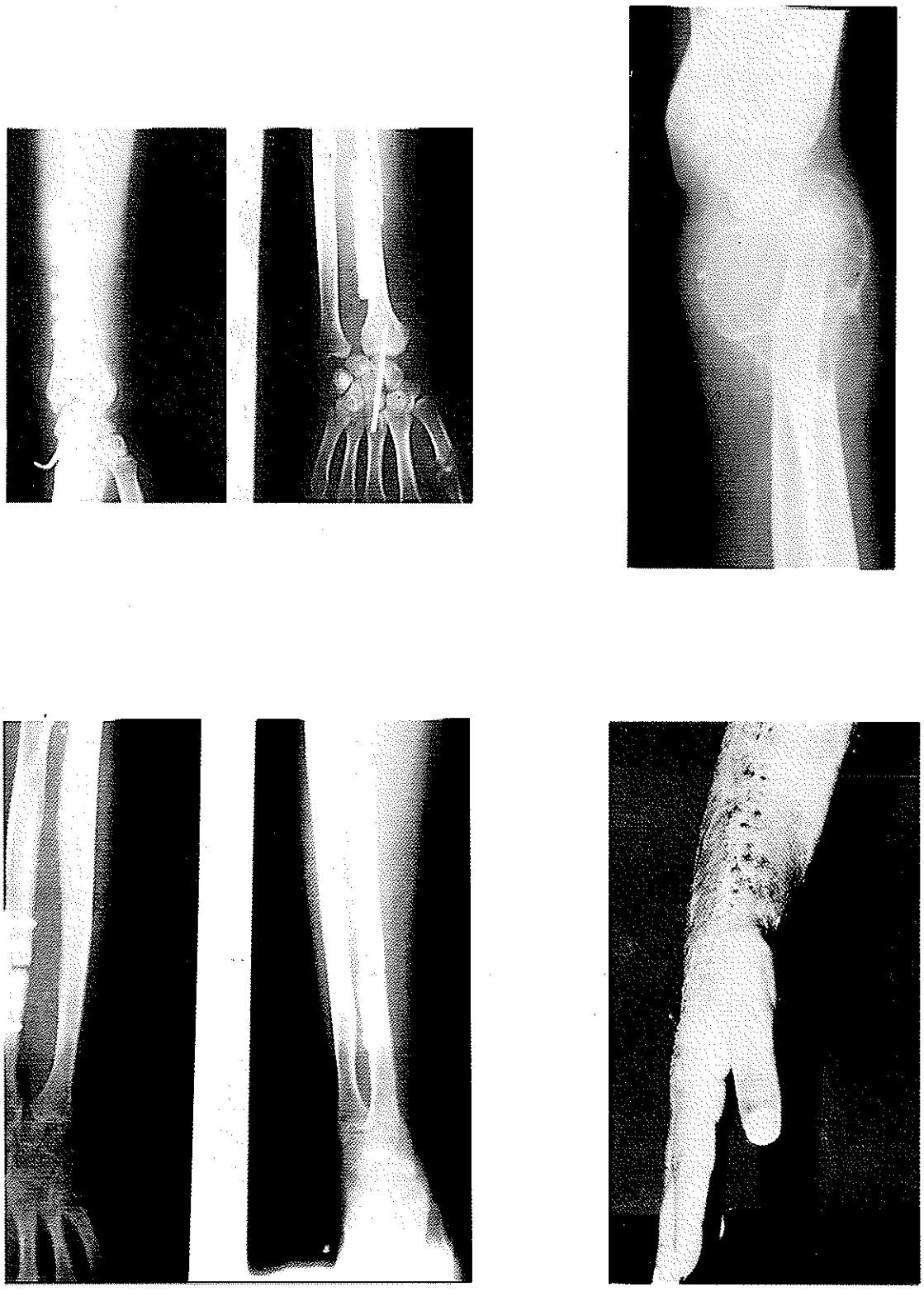

Fig. 3. Case 3: Before and after operation

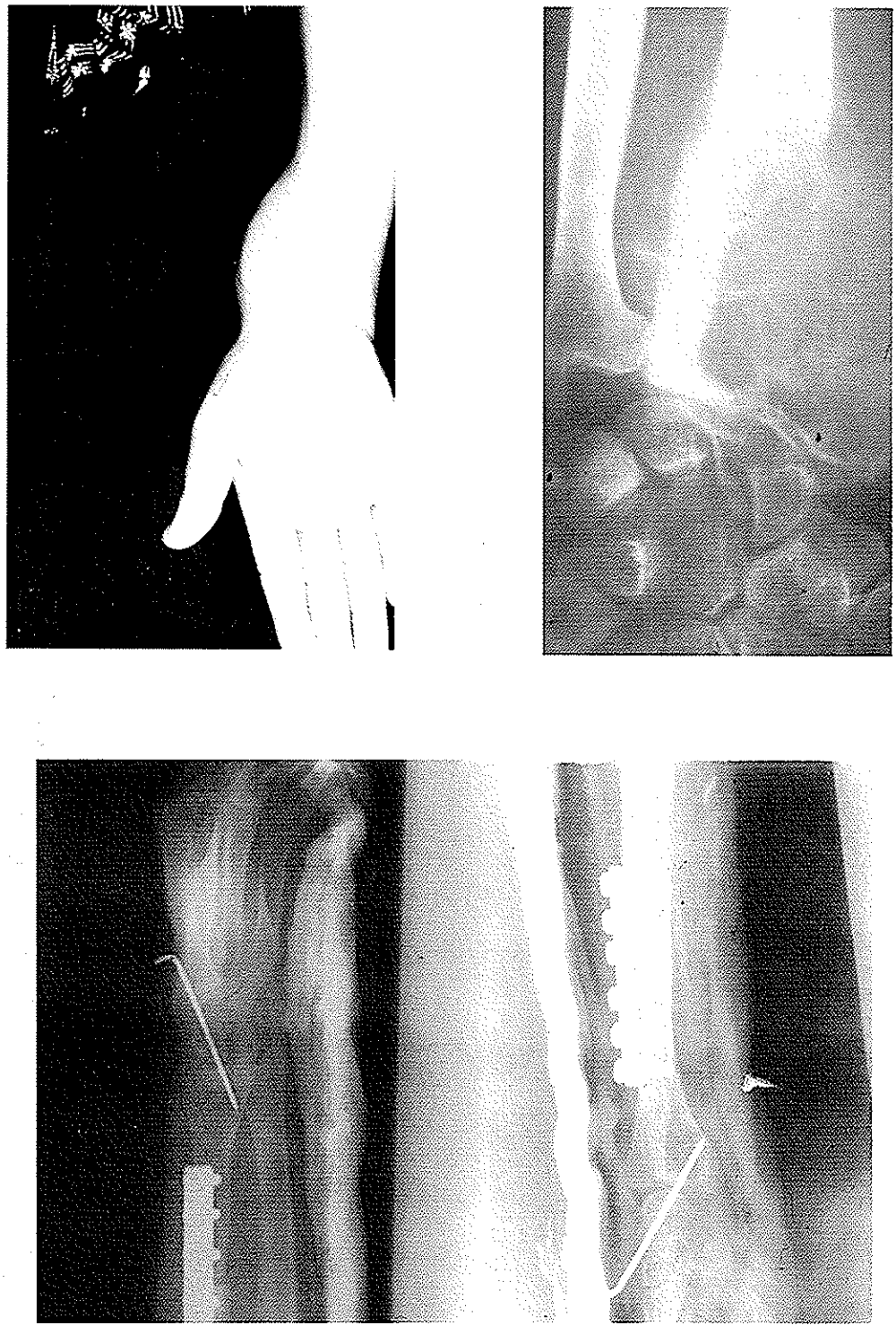

Fig. 4. Case 4 : Before and after operation

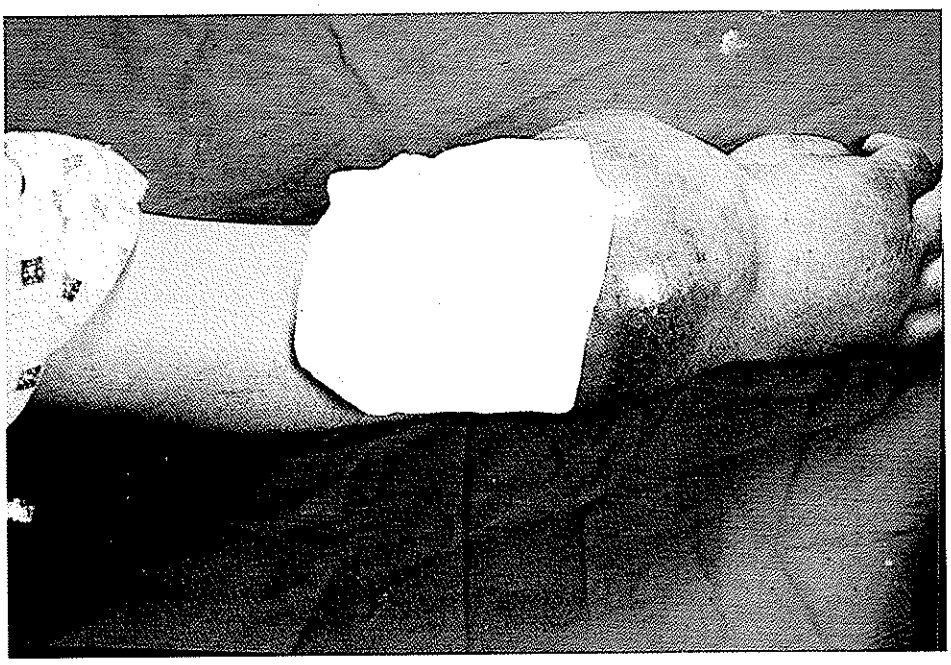

Fig. 5. Case 5

DISCUSSION

Giant cell tumor is a benign but potentially aggressive locally destructive neoplasm that develops within bone (1), typically the lesion develops in the region of the epiphysis of long bones after the growth plate has closed (2), and it extends by growth into the metaphysial area (14). The majority of develop in the lower end of the femur, the upper end of the tibia and the lower end of the radius in young adults (7).

Radiographic examination discloses an area of rarefaction in the end of a bone with a thinned and expanded cortex and no evidence of periosteal new bone formation over the thinned expanded cortex (6).

The origin of the tumor is unknown (13,15,16). Treatment of giant cell tumor can be tailored to the individual patient, depending on the size of the tumor, destruction of bone and extension into soft tissues (12, 17,18).

The standard treatment of GCT is curettage and bone grafting, although the overall recurrence rate is still high, the rate for lesions of long bones is approximately 25 percent. After recurrence, if the tumor is highly aggressive locally the treatment of choice is enbloc resection and proximal fibular autograft. In a neglected GCT with massive soft tissue extension, amputation may be indicated (19,20).

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