Excision of Osteosarcoma of Patella without Extensor Mechanism Reconstruction: A Case Report
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Learning Point of the Article:
Osteosarcoma patella can be managed well without extensor mechanism reconstruction.

Abstract

Introduction: Osteogenic sarcoma of patella is extremely rare and only few cases have been reported in the literature so far. Limb salvage, particularly reconstructing extensors of the knee, is a matter of debate in available literature. Henceforth, we would like to present this uncommon case of patellar osteosarcoma in a young female managed by chemotherapy and wide excision without extensor mechanism reconstruction.

Case Report: A 25-year-old female had a history of painless swelling around the left knee for 6 months, which was progressively increasing in size. It was diagnosed as osteoblastic osteosarcoma patella radiologically, confirmed by open biopsy. The patient was managed by recommended protocol comprising neoadjuvant chemotherapy followed by tumor excision, thereafter chemotherapy in post-operative period. However, no reconstruction of the extensor mechanism was done. At 1-year follow-up, the patient was able to perform activities of daily living without any discomfort. She was able to ambulate unaided with no extensor lag.

Conclusion: For managing a case with osteosarcoma patella, chemotherapy along with optimal excision comprising total patellectomy without extensor mechanism reconstruction is a viable option.

Keywords: osteosarcoma patella, extensor mechanism, excision.

Case Report
A 25-year-old female had a history of painless swelling around the left knee for 6 months, which was progressively increasing in size. There was no associated history of trauma. Clinically, a firm tender swelling of size 5 × 5 cm arising from patella was palpable. The range of motion of the knee was 15–110° degrees. Atrophy of the left thigh muscles was noted. A plain radiograph revealed enlarged left patella with irregular, thinned out cortical shell along with multiple osteosclerotic lesions in patella with a soft-tissue mass (Fig. 1).

Magnetic resonance imaging demonstrated a tumor mass of size 4.5 × 8 × 10.2 cm (AP × TR × CC) involving tendon of quadriceps femoris, patellofemoral ligaments, and patellar ligament. Post-contrast images demonstrated an enhancement in muscular plane of anterior compartment in axial cuts. Sagittal STIR images showed heterogeneously hyperintense signal within the tumor and multiple hypointense areas which are
Postoperatively, the patient received three cycles of chemotherapy as per protocol. At 1-year follow-up, the patient was able to perform activities of daily living without any discomfort. The range of motion was 0–90° degrees. The patient is still under regular follow-up with no evidence of recurrence. She could ambulate unaided with no extensor lag.

Discussion

Although patella is a rare site for tumorous growth, chronic anterior knee pain/swelling should always arouse a suspicion for such a possibility [1, 2, 3, 4]. Incidence of osteosarcoma patella reported in the literature is 6% of all patellar tumors with 35 reported cases in the English literature [5, 6, 7, 8]. Because of such low incidence, there is a scarcity of the literature related to management with only 10 case reports published till date.

Surgical excision is the treatment of choice for osteosarcoma at any site. Depending upon the nature of tumor mass and stage of growth, various options available for excision of patellar osteosarcoma are conservative patellectomy, extensive patellectomy, extra-articular knee resection, and above-knee amputation. For patients with stage Stage 1b and 2a, extensive patellectomy is the recommended procedure [1]. Following
Out of the 9 nine case reports in the literature, 4 four patients underwent above-knee amputation, 2 two had knee resection, and 2 two patients underwent patellectomy with extensor mechanism reconstruction. 3 Three patients among these 9 nine reported cases died of disease, 4 four had no evidence of disease at present, and 2 two patients were alive with disease at the time of reporting. Not much information is available regarding the management of the case reported by Shehadeh et al. [8]. With such high morbidity, one should aim for complete eradication of disease, thus improving survival at the cost of functional rehabilitation and not vice versa.

Details of the treatment done for Osteosarcoma patella

It has been reported by several authors previously that no major knee dysfunction results after complete patellectomy [14, 15]. Also further more, a supportive brace helps in unaided ambulation. Even without or with weak extensor mechanism of knee, the patient is able to carry out activities of daily living, as seen in polio patients. The same was observed in our case. At one 1-year follow-up, the patient is ambulating comfortably and unaided with no extensor lag. Though Although one 1 year is a short time to comment upon outcome after the management of malignant tumor in terms of survival, however, in our case, we have highlighted upon functional outcome even without extensor mechanism reconstruction.

### Clinical Message

For management of osteosarcoma patella, wide excision of tumor with clear margins should be of prime importance. Good functional rehabilitation can be achieved after excision alone without extensor mechanism reconstruction.

### Table 1: Details of the treatment done for osteosarcoma patella

| Treatment                        | Number of cases | Method of extensor mechanism reconstruction | Prognosis | Author, year (ref) |
|----------------------------------|-----------------|---------------------------------------------|-----------|-------------------|
| 1. Conservative patellectomy     | 0               | -                                           | -         | -                 |
| 2. Patellectomy                  |                 | With reconstruction                          |           |                   |
|                                  | 2               | -Allograft patella                          | NED       | Cho et al., 2009 [5] |
|                                  |                 | -Free anterolateral thigh flap              | NED       | Aoki et al., 2014 [7] |
|                                  | 1               | Without reconstruction                       | NED       | Current case       |
| 3. Knee resection                |                 | Modular bone ingrowth prosthesis and recon   | NED       | Ferguson et al., 1997 [9] |
|                                  | 1               | of the extensor mechanism                   |           |                   |
|                                  |                 | Arthrodes                                    | DOD       | McGraith et al. [10] |
| 4. Above-knee amputation         | 2               | -                                           |           |                   |

NED: No evidence of disease, DOD: Died of disease, AWD: Alive with disease

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