

Hemipelvectomy for the Radiologist: Indications, planning, and imaging

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Purpose: Hemipelvectomy (HP) has received limited attention in the radiology literature, but is performed in a subset of patients with pelvic tumors, infection, or trauma. This educational exhibit's purpose is to improve the musculoskeletal radiologist's expertise in multidisciplinary planning and postoperative imaging.

Materials and Methods: The electronic exhibit has four main educational goals: 1) discuss indications for HP, 2) review the classification for the types of HP, 3) highlight important imaging anatomy in HP planning, and 4) discuss post-operative imaging appearance of myocutaneous flaps and prosthetic reconstructions. Patient cases (13 total cases) will show pre-operative MR imaging with annotation of critical structures. Discussion will include (a) tumor margin, (b) neurovascular structures that should be disease-free to maintain option for internal HP; and (c) vascular pedicle identification for anterior and posterior flaps. The

Enneking and Dunham classification will be discussed with illustration and radiographic examples.

Results: HP is an extensive and technically challenging procedure used to manage patients with primary or metastatic pelvic malignancy, severe pelvic infections, or severe pelvic trauma. Preoperative evaluation includes pelvic radiography, CT and MR imaging with close scrutiny of the sciatic nerve, femoral neurovascular bundle, and femoral acetabular joint.

HP is subdivided into external and internal types. For external HP, tumor extent or injury prevent limb salvage and the entire bony hemipelvis is resected with hindquarter amputation. Coverage is achieved with a myocutaneous flap which may be an anterior, posterior, island, or free flap. Internal HP is resection of only a portion of the hemipelvis, typically with lower limb salvage. Pre-procedure planning allows selection of a resection strategy based on the Enneking and Dunham classification. The musculoskeletal radiologist should understand this classification as post-operative imaging and complications vary between types. Use of flaps and megaprotheses have been shown to improve patient outcomes, but also carry high complication rates including infection and flap non-viability.

Conclusion: Imaging plays a key role in the multidisciplinary planning of HP resection margins, reconstruction, and flap coverage. While these cases are infrequent, it is crucial that the surgery team receive expert imaging support for safe performance and follow-up of this challenging procedure.