

Transarticular tumor invasion via ligamentum teres

A clinical-pathologic study of 12 patients

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We studied 12 patients who were operated on for malignant tumors in and around the hip joint. A correlative study, including preoperative staging studies and anatomical-pathologic aspects of the hip joint, was performed. In 4 of the 12 patients, we

found direct histologic evidence of tumor invasion from the head of the femur through the ligamentum teres to the acetabular fovea and vice versa. It seems that the ligamentum teres is a potential route for transarticular spread of a tumor.

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The spread of tumor cells across joints is uncommon but has been reported to occur in several ways (Simon and Hecht 1982). Transarticular tumor spread from the femoral head to the pelvis and vice versa via the ligamentum teres has not, to our knowledge, been described. We examined the possible contribution of the ligamentum teres to the dissemination of tumor cells across the hip joint.

operated on because of malignant tumors (2 sarcomas, 10 metastases). Preoperative staging studies included plain radiographs, bone scans, CT and MRI. All surgical specimens from the femoral head, ligamentum teres and acetabulum were evaluated histologically (Table).

In 4 of the patients (cases 8, 9, 11 and 12), tumor was found in the ligamentum teres, in 1 Ewing's sarcoma and 3 metastatic lesions (Figure). In these cases, tumor was also found on both sides of the joint—i.e., in the femoral head and the acetabulum. In these patients, the correlation with the staging studies was excellent; tumor was preoperatively identified in the femoral head and the acetabulum. In the other 8 cases, there was a poor correlation between the staging stud-

Patients, methods and findings

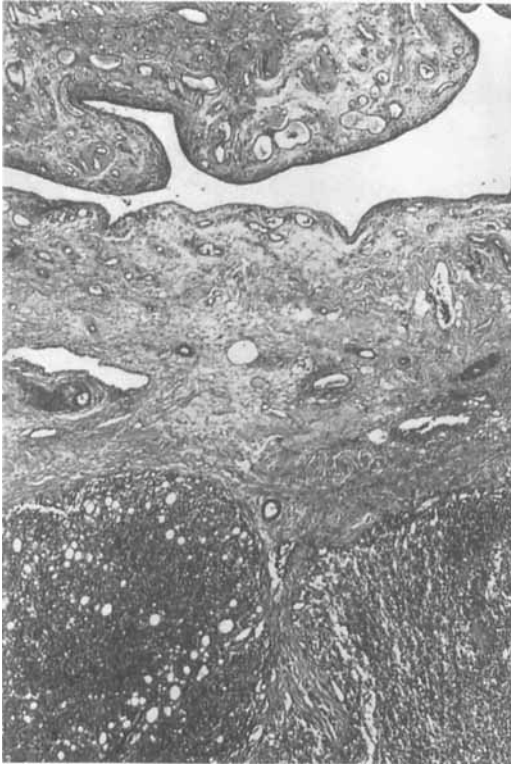
Our series includes 12 consecutive patients (9 hemiarthroplasties, 1 extended hip replacement and 2 extended pelvic resections including the hip joint)

Patient data

Age	Sex	Diagnosis	Staging studies ^a		Histopathologic evidence of tumor			Correlation ^b	
			Femoral head	Acetabulum	Femoral head	Lig. teres	Acetabulum		
1	80	M	Carcinoma of prostate	+	—	+	—	+	—
2	67	M	Carcinoma of lung	+	—	+	—	—	+
3	70	M	Carcinoma of prostate	+	+	+	—	+	+
4	75	M	Carcinoma of prostate	+	+	+	—	—	—
5	52	F	Chondrosarcoma	—	+	—	—	+	+
6	68	F	Carcinoma of breast	+	+	+	—	+	+
7	78	M	Carcinoma of prostate	+	+	—	—	+	—
8	71	M	Carcinoma of prostate	+	+	+	+	+	+
9	60	M	Carcinoma of kidney	+	+	+	+	+	+
10	68	F	Carcinoma of bladder	+	—	+	—	—	+
11	12	F	Ewing's sarcoma	+	+	+	+	+	+
12	65	F	Carcinoma of breast	+	+	+	+	+	+

^a Including plain radiography, bone scan, CT, MRI

^b Between the staging studies and the histopathologic findings



Microscopic section from mid-substance of the ligamentum teres (case 12), showing metastatic poorly differentiated carcinoma at bottom of the picture (HE \times 130).

ies and the histopathological findings. In cases 1, 3 and 6, all with metastatic disease, tumor was found in the femoral head and acetabulum, but not in the ligamentum teres (Table).

Discussion

Transarticular tumor extension can occur by 1) direct invasion of soft tissues around a joint, 2) spreading through the capsule and extraarticular ligaments, 3) direct invasion via the articular surfaces and 4) spreading via intraarticular structures, such as the tendon of the long head of the biceps muscle in the shoulder or the cruciate ligaments of the knee (Simon and Hecht 1982).

In 4 of our patients we found tumor cells in the ligamentum teres and on both sides of the joint, histologically, and in the preoperative staging studies. In these cases, transarticular tumor spread may have occurred via the ligamentum teres. However, in 3 other cases, tumor was found in the femoral head and the acetabulum, but not in the ligamentum teres. In these cases, all metastatic carcinoma, tumor cells may have reached both sides of the joint by hematogenous spread from the primary tumor.

While planning an operation for tumors around the hip joint (as in other joints), one must consider the possibility of tumor cells on both sides of the joint or inside it, which may necessitate an extraarticular joint resection (Enneking 1983).

References

- Enneking W F. Surgical procedures, pelvis. In: Musculoskeletal tumor surgery. Churchill Livingstone, New York, Edinburgh, London and Melbourne 1983; 1: 483-529.
- Simon M A, Hecht J D. Invasion of joints by primary bone sarcomas in adults. *Cancer* 1982; 50: 1649-55.