

Incidental Pelvic Schwannoma: A Case Report

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Abstract

Introduction: Incidental findings are identified on 35% to 45% of trauma CT scans. Most commonly, they are found on CT scans of the abdomen/pelvis in female patients older than age 60. Multiple studies show that the majority of these findings are benign and do not require urgent intervention. Many patients are discharged without notification of their findings or sufficient follow-up care.

Case description: A 28-year-old male presented as a trauma alert after a rollover motor vehicle collision. He was assessed according to ATLS protocol and underwent CT scans of his head, neck, chest, abdomen, and pelvis. Imaging showed a fracture of his C1 vertebrae, so the patient was placed in an Aspen collar by neurosurgery and admitted to the hospital. The CT scan also showed an incidental 11 cm × 9.5 cm × 12.6 cm solid mass containing areas of calcification and hemorrhage displacing the bladder and the right external iliac vein. A CT guided biopsy of this mass was performed and sent for pathological evaluation. Results returned as a spindle cell lesion, positive for S-100 and negative for desmin and vimentin. Decision was made to respect the mass based on its large size and potential for obstructive or compressive symptoms. Pathology was positive for a schwannoma.

Discussion and Conclusion: Our case describes a rare benign neoplasm found incidentally after a work-up for trauma. Schwannomas account for 5% of benign soft tissue neoplasms, occurring primarily as solitary, slow-growing lesions in patients 20 to 40 years of age. They are rarely symptomatic unless their size results in compression of surrounding structures. They appear as heterogenous encapsulated masses with degenerative and cystic cavitations on imaging. They will routinely stain positive for S-100 on histological examination.

Keywords: Schwannoma; Immunohistochemical stains; Peripheral nerve sheath tumor; Computed tomography

Introduction

Computed tomography (CT) has become the gold standard in the diagnosis of injury in trauma patients. A large number of trauma patients undergo CT scans of the head, neck, chest, abdomen, and pelvis for initial evaluation. These scans not only demonstrate traumatic injury, but studies have shown that 35% to 45% also reveal incidental findings [1-3]. Puluska et al., published a study in 2007 involving 991 patients, which demonstrated that the incidence of these findings was more common in women older than age 40 and more likely found on CT scans of the abdomen and pelvis [3]. Barrett et al., published a similar review in 2009 with comparable results [4]. Review of the literature shows that the majority of these findings are either anatomic variants or benign pathologic findings [1,5].

A significant observation surrounding these incidental findings is the lack of documentation regarding these results during their hospital stay and lack of appropriate follow-up after discharge. A retrospective study by Munk et al., included 211 patients, and of those, only 57 patients (27%) had incidental findings noted in the discharge summary, documentation of further work-up, or subsequent referral [2]. Devine et al., also showed that only 31% of patients had appropriate documentation of an incidental finding on diagnostic/surveillance imaging [6]. We present an interesting case of a pelvic schwannoma discovered as an incidental mass on surveillance CT scan of the abdomen and pelvis after a motor vehicle collision. The patient was referred to surgical oncology with subsequent diagnostic work-up and treatment while being treated as an inpatient for his traumatic injuries.

Case Presentation

A healthy 28-year-old male patient presented as a trauma alert after a rollover motor vehicle collision on a local interstate. He was assessed according to advanced trauma life support protocol and stabilized by

the trauma service. He subsequently underwent a CT scan of the head, neck, chest, abdomen, and pelvis. Imaging studies revealed a fracture of his C1 vertebrae. The patient was placed in an Aspen collar and admitted to the hospital for neurological monitoring and physical therapy.

The CT scan of the abdomen and pelvis showed an incidental 11 cm × 9.5 cm × 12.6 cm solid mass containing areas of calcification and hemorrhage displacing the bladder and the right external iliac vein (Figure 1). The patient denied any compressive symptoms including polyuria or dysuria. He also denied any motor or sensory deficits in his lower extremities. Surgical oncology was consulted, and a CT-guided biopsy of this mass was performed and sent for pathological evaluation. The biopsy results demonstrated a spindle cell lesion, which was positive for S-100 and negative for desmin and vimentin (Figure 2). After an extensive discussion with the patient and the surgical oncology team, decision was made to respect the mass based on its large size, questionable cancer diagnosis, and potential for future obstructive or compressive symptoms.

Bilateral ureteral stents were placed by urology at the beginning of the case. An exploratory laparotomy was performed utilizing a

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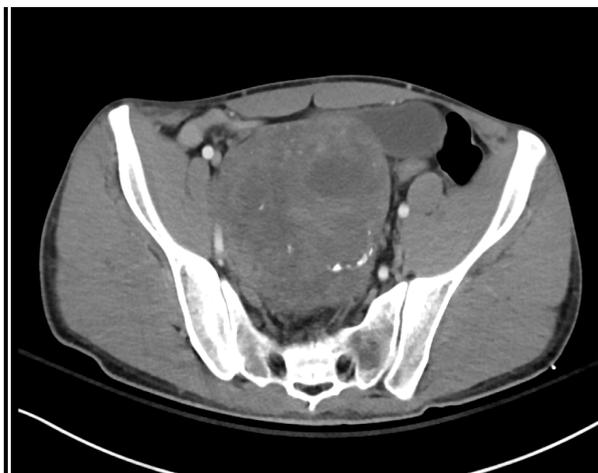


Figure 1: Computed tomography scan of the abdomen and pelvis demonstrating the incidental 11 cm × 9.5 cm × 12.6 cm solid pelvic mass (white arrow) containing areas of calcification and hemorrhage displacing the bladder and the right external iliac vein.

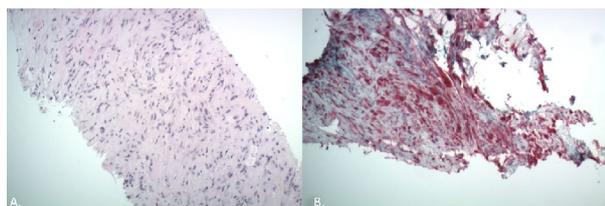


Figure 2: **A.** (Hematoxylin and eosin (H&E) 20x magnification) Sections of the CT-guided biopsy specimen showing neoplasm composed of bland-appearing spindled cells, **B.** Positive S-100 staining.

lower midline abdominal incision. It was densely adherent to the right common iliac vein, which was carefully freed by a combination of blunt and sharp dissection, allowing the mass to be removed from the pelvis intact. The ureters were identified and palpated to confirm continuity at the conclusion of the case. The mass was sent to pathology for routine staining and sectioning (Figure 3). The patient’s post-operative course was unremarkable. He was discharged on post-operative day six after return of bowel function. His follow-up appointments were arranged for his arrival home in Boston, Massachusetts. His pathology report showed a 13.2 cm × 10.5 cm × 8.0 cm spindle cell lesion most consistent with Schwannoma (Figure 4). Histological staining was strongly positive for S100, but negative for CD-117, DOG-1, SMA, and desmin. Microscopically, the mass exhibited areas of thick, collagenized capsule, hemorrhage, fibrin deposition, calcification, and heterotopic bone formation.

Discussion

Peripheral nerve sheath tumors of the pelvis are relatively uncommon and rarely malignant without an underlying diagnosis of neurofibromatosis [7]. The benign subset of these tumors can be divided into neurofibromas and schwannomas [8]. Distinguishing between benign and malignant peripheral nerve sheath tumors can be difficult. Benign lesions rarely produce pain at rest in the lower extremities or neurological deficits. Benign lesions typically exhibit central enhancement and target sign on magnetic resonance imaging, which is uncommon with malignant variations. Fine needle aspiration

of these tumors is not beneficial due to the high false positive rate secondary to cellular atypia and poor sampling from degenerative tissue. Core needle biopsy is the preferred method for sampling as it enables examination of the tumor architecture and interrelation of its cells. The specimen is also amenable to special testing or staining which aids in obtaining an accurate diagnosis [9].

Benign peripheral nerve sheath tumors can be differentiated by their strong staining of S-100 protein on immunohistochemical (IHC) staining. S-100 protein is found in cells of neural crest origin, including both Schwann and melanocytic cells [10]. In a study of 30 patients from Japan with peripheral nerve sheath tumors, all benign tumors were diffusely positive for S-100 protein, whereas malignant tumors were focally positive or negative for this protein. Different IHC stains have been used to diagnose other potential pathologies including CD-117 and DOG-1 for gastrointestinal stromal tumors and SMA and desmin for desmoid tumors like those performed on the gross pathological specimen in our case report [7].

Schwannomas routinely present as solitary, painless, slow-growing masses that represent approximately 5% of all benign soft-tissue neoplasms. They are typically diagnosed in patients age 20 to 40 years old [8]. The most common locations for these neoplasms are the

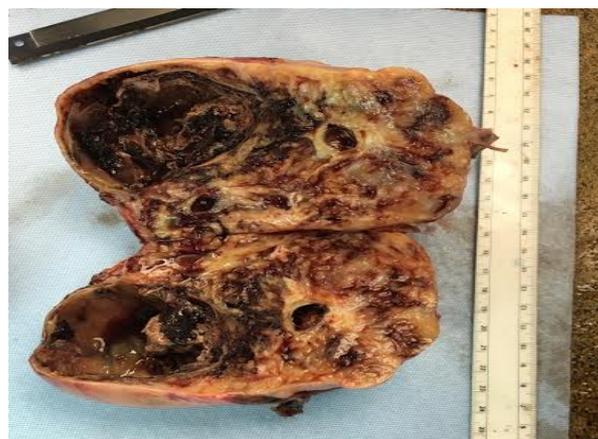


Figure 3: Gross pathological specimen.

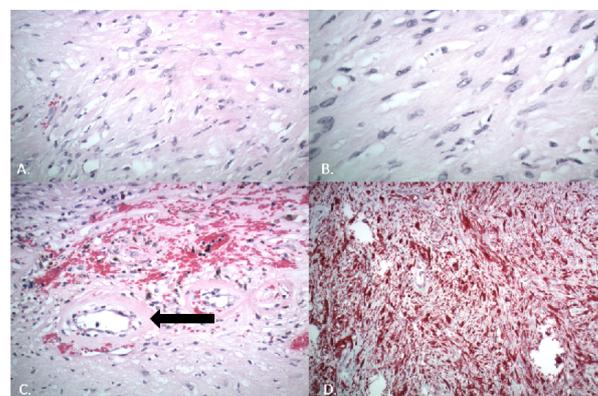


Figure 4: **A and B.** (H&E 20x and 40x magnification) Resection specimen composed of bland-appearing spindled cells. **C.** (H&E 20x magnification) Hyalinized blood vessels (black arrow), **D.** Positive S-100 staining.

cerebellopontine angle, posterior spinal nerve roots, flexor surfaces of the extremities, neck, mediastinum, and retroperitoneum [8]. They are microscopically comprised of schwann cells characterized by elongated spindle-like nuclei organized into dense (Antoni A) areas or loose, hypocellular (Antoni B) areas. The peripheral nerve of origin does not penetrate the substance of the tumor. Multiple types of degenerative changes may be found within schwannomas including nuclear pleomorphisms, xanthomatous changes, vascular hyalinization, cystic changes, necrosis, and mitotic activity [11,12]. These patients are generally asymptomatic unless these tumors become large enough to compress adjacent structures. Commonly, they are amenable to surgical excision because they rarely invade the underlying nerve fibers [8].

Conclusion

Incidental findings, such as the benign pelvic schwannoma discovered in our patient, are becoming more prevalent as the use of CT scan for the diagnosis of traumatic injuries increases. Studies have demonstrated that a large number of these findings are overlooked and not documented, resulting in ethical and medical-legal ramifications for providers [1-3]. Due to the potential for harm if left untreated, many hospital systems are developing a system for electronic medical record documentation and coordination of follow-up with appropriate specialists. This improved documentation allows the patient to be established with the correct surgical specialty team capable of providing the recommended surveillance and subsequent treatment. This may ultimately decrease health care costs by decreasing redundancy in follow-up and needless imaging studies. Further research into the most effective method for this system is warranted.

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