

Post-Traumatic Sarcomas: Do they Exist? (11416)

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Introduction: Current literature suggests that there is no direct link between a previous history of injury and subsequent cancer development. In contrast, others have suggested that cancer development is preceded by local inflammation and/or fibrosis secondary to trauma. One example of a malignancy developing from inflammation/injury is a marjolin's ulcer (squamous cell carcinoma) but this type of inflammation/injury is typically chronic in nature. Anecdotally, many patients often cite an injury or trauma prior to the development of symptoms that eventually resulted in the diagnosis of sarcoma. To better understand this possible link between sarcoma and injury, we retrospectively identified six patients at our Institution who had developed sarcomas at the site of a previous high-energy traumatic injury. The purpose of this review was to better understand the factors that may lead to development of a sarcoma after a traumatic injury.

Materials and Methods: We retrospectively reviewed six patient's charts with a documented history of significant traumatic injuries whom later developed a sarcoma at the site of injury.

Results:

Case 1:

Age/Sex: 47 year old male

Location/Type of sarcoma: Leg/soft-tissue sclerosing rhabdomyosarcoma

Traumatic Injury/Treatment: Open tibia shaft fracture from motor vehicle accident/Open reduction internal fixation

Related Injury Factors: Infection/Multiple operations

Latency Period: 25 years

Sarcoma Treatment: Failed limb salvage/Amputation/Chemotherapy

Outcome: Death after 3 years from date of diagnosis due to metastatic disease

Case 2:

Age/Sex: 35 year old male

Location/Type of sarcoma: Distal femur/Osseous high grade pleomorphic undifferentiated sarcoma

Traumatic Injury/Treatment: Communitied distal femur from gunshot/Arthrodesis

Related Injury Factors: Infection/Multiple operations

Latency Period: 10 years

Sarcoma Treatment: Amputation/Chemotherapy

Outcome: Death less than one year from date of diagnosis due to metastatic disease

Case 3:

Age/Sex: 68 year old male

Location/Type of sarcoma: Distal tibia/Osseous high-grade pleomorphic undifferentiated sarcoma

Traumatic Injury/Treatment: Closed pilon fracture from motor vehicle accident/Open reduction internal fixation

Related Injury Factors: None

Latency Period: 29 years

Sarcoma Treatment: Amputation

Outcome: Death less than one year from date of diagnosis due to metastatic disease

Case 4:

Age/Sex: 73 year old male

Location/Type of sarcoma: Forearm/soft-tissue sclerosing rhabdomyosarcoma

Traumatic Injury/Treatment: Crush injury to forearm/skin grafting/wound closure

Related Injury Factors: Multiple Operations

Latency Period: >30 years

Sarcoma Treatment: Patient refused a recommended amputation/Chemotherapy

Outcome: Death after 1 year from date of diagnosis due to metastatic disease

Case 5:

Age/Sex: 35 year old female

Location/Type of sarcoma: Tibia /Osseous malignant peripheral nerve sheath tumor

Traumatic Injury/Treatment: Gunshot to tibia/Debridement/Rotational Flap

Related Injury Factors: Multiple operations

Latency Period: 10 years

Sarcoma Treatment: Amputation

Outcome: Alive with metastatic disease two year out diagnosis

Case 6:

Age/Sex: 50 year old male

Location/Type of sarcoma: Right leg/High-grade malignant triton tumor

Traumatic injury/Treatment: Open tibia shaft fracture from motor vehicle accident/external fixator treatment with multiple debridements and rectus flap for wound coverage.

Related Injury Factors: Multiple operations, wound infection

Latency Period: 15 years

Sarcoma Treatment: Radical resection of the sarcoma and free latissimus flap/skin graft

Outcome: Alive without evidence of metastatic disease

Conclusion: The link between cancer and injury remains controversial. Our small retrospective review suggests that traumatic injuries can predispose some patients to develop a sarcoma later at the site of the injury. 5 (83%) patients had multiple operations, and 3 (50%) patients had history of wound infection. Three out of the six patients developed an osseous sarcoma, in which, two were high-grade pleomorphic undifferentiated sarcomas. The two out of three soft-tissue sarcomas were sclerosing rhabdomyosarcomas. Four patients underwent amputations. One patient refused a recommended amputation, and the other patient underwent wide resection of sarcoma. The average time from injury to development of the sarcoma was 19.8 years. Survival

after recognition is poor, and 67% of the patients died due to their metastatic disease within three years of diagnosis.

While the correlation between traumatic injuries and development of sarcoma is not exactly clear, our current hypothesis is that the injury itself may not be the sole contributing factor, but it appears that the repetitive insult from the multiple operations may play a significant role. Our analysis was hindered by the lapse in time between traumatic injury and the sarcoma diagnosis, and this resulted in a recall bias. In any case, the role of previous traumatic injury and/or repeated surgery in its relationship to sarcoma development is a topic that warrants further investigation.