interaction between the tumor cells and cells that populate bone marrow, in particular osteoblasts and osteoclasts, is important for creating a “fertile” environment where tumor cells can establish and grow. Prostate cancer cells are capable of producing growth factors that can affect both osteoblasts, resulting in osteoblastic bone formation, and osteoclasts, resulting in excessive bone resorption. In addition to the capability to progress from testosterone-dependent to testosterone-independent phenotype, the hallmark of metastatic prostate cancer is osteosclerosis similar to one induced experimentally in nude rats using CWR22 human prostate cancer cell line.

Metastatic bone disease caused by excessive bone formation and bone resorption is the major cause of morbidity in patients with prostate cancer. The most common symptoms include pain, pathological fractures, spinal cord compression, cranial nerve palsies, bone marrow suppression and hypercalcemia. The introduction of prostate specific antigen in clinical practice created a shift where more prostate cancer patients with early disease receive androgen ablation treatment, which in return causes more symptoms.

**Figure 1:** Radiography depicts tibia of the nude rat six weeks following intra-tibial injection with PC-3 (A; osteolytic) and CWR22 (B; osteoblastic) human prostate cancer cell lines. Arrowhead(s) indicate osteolytic and osteoblastic bone response to cancer cells.
bone loss and cancer associated osteoporosis.\textsuperscript{26-28} Introduction of the third generation of bisphosphonates to treat skeletal consequences of malignancy further stressed the important interaction between the bone marrow stroma and cancer cells.\textsuperscript{29-31} Animal models and human prostate tumor cell lines that mimic all aspects of skeletal conditions in prostate cancer patients including osteoblastic bone response are highly desirable in order to develop and screen for novel therapeutic and diagnostic modalities.

References

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