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Case Report

Management of Chronic Pain in Multiple Myeloma

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Abstract

Background: Multiple Myeloma is almost often discovered when a patient has abnormal blood and urine specimen results. Patients presenting with chronic bone pain as well as anemia are always suspicious of multiple myeloma. Also pathological as well as general fatigue will always be suspicious of this condition. The duties of nursing team when caring for a multiple myeloma includes but not limited to formulating a Nursing Care Plan by creating a nursing diagnosis for chronic pain, impaired physical mobility and anxiety related to this new diagnosis and its prognosis. It is important to mention that like with most orthopedic conditions; chronic pain cannot necessarily be resolved within 30 minutes of administration of analgesia. These patients benefit immensely through the collaboration of the members of the multidisciplinary team. *Methods:* A case study was conducted when doing this research about Multiple Myeloma. Patient first presented at a Johannesburg Hospital in a trauma Casualty Department. Patient met with the researcher in an orthopedic ward in June 2024. Data was collected through interviews, observation and comprehensive physical examination of an orthopedic patient. Attending orthopedic surgeons, palliative team, dietician, physical therapists as well medical oncologists were also interviewed. *Conclusion*: Nursing problems were only resolved after almost two months of admission. The patient's pain intensity was reduced from7/10 to 3/10 on a pain scale after bilateral femur nailing and the adjustment of analgesics from Tramadol to morphine sulphate. The patient also benefited from palliative care counselling as well as chemotherapy.

Keywords

Multiple Myeloma, Pathological Fracture, Chronic Pain, Nursing Care Plan

1. Introduction

Multiple myeloma is a hematologic malignancy [1] that develops in the plasma cells in the bone marrow. Plasma cells are differentiates B-lymphocyte white blood cells capable of secreting immunoglobulin or antibodies [2]. It occurs in the bone marrow with most activity in several areas of the body such as the spine, pelvis, ribs, shoulders and hips. In the early stages of the disease multiple myeloma is asymptomatic which is called smoldering myeloma [3]. Symptomatic or active myeloma may cause symptoms by taking over the bone marrow, thus causing clinical features such as anemia [4], renal failure, lytic bone lesion [5], recurrent infections [6], weight loss [7], persistent bone pain [4], weakness and shortness of breath due to anemia, blurred vision, bruising and unusual bleeding such as epistaxis and bleeding gums, weak bones that fracture easily and hypercalcaemia [8]. Even without these symptoms; laboratory results may define multiple myeloma that requires treatment. Multiple myeloma does not usually cause any tumors.

The most significant factor for multiple myeloma is age, as 96% of cases are diagnosed in people who are older than 45

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years. Globally multiple myeloma is ranked 24 among common cancers [9].

The diagnostic work up and procedures to diagnose multiple myeloma include blood tests, urine tests [10], bone marrow biopsy [11], Imaging; that is; X-ray, MRI: Magnetic Resonance Imaging, CT : Computed Tomography and PET: Positron Emission Tomography scans [12]. MRI is preferred in case of a spinal compression. CT is more sensitive for small long bones and can differentiate benign from malignancy compression fractures. DEXA: Dual –Energy X-ray absorptiometry scan has no role in diagnosing multiple myeloma; [13]. PET scan can be used for staging and follow up.

The differential diagnoses for multiple myeloma includes monoclonal gammopathy of undetermined significance, smoldering multiple myeloma, Waldestrom Macroglobulinemia, Light-Chain Amyloidosis, and plasmacytoma [14].

2. Methods

A case study was used for this research design. The case study approach allows in-depth multi-faceted exploration of complex issues in their real-life settings [15]. In this study the participant is a 50 year old female patient. The patient was admitted on the 26th June 2024 and was discharged on the 30th of August 2024. The researcher maintained the patient's right to privacy and confidentiality throughout the course of the admission. Data was collected by interviewing, the patient and her doctors as well as observing the patient.

3. Results

Ms. K***, an African female, 50 years of age, unemployed presented at Charlotte Maxeke Johannesburg Academic Hospital Trauma Casualty Department as a referral from a local community clinic. Patient was complaining of pain and swelling on the right thigh. Patient is a known Type II Diabetes patient on treatment and had a past surgical history of having a Caesarean Section and an appendectomy. Patient neither smokes nor drinks. No known allergies were reported by the patient. Patient reported that she had not been feeling well for the past 6 months. She also reported fatigue which is the reason she was using a wheelchair and ended up falling.

Patient had a history of loss of weight, and being unable to weight bear. She had fallen on the hip from the wheelchair. Vital signs were taken: Temperature 36.2°C, Pulse 74 beats per minute, Respiration rate of 22 per minute, HGT: Hemo Glucose Test 6.6 millimoles per liter.

On physical examination patients right thigh was swollen and tender. She did not have any wounds. She did not have thyroid, abdominal or breast masses. Patient was pale on the conjunctiva and on palm of her hands. Her neurovascular system was not compromised: Circulation was present, capillary refill was less than 2 seconds, skin colour was natural, and skin temperature was warm to touch. Pedal pulses were felt and the patient was able to wiggle her toes. Her X-rays showed a right pathological intertrochanteric fracture. On skin examination the patient had a Grade I pressure injury on the right heel.

Patient was subsequently admitted in a Tumor and Sepsis Orthopedic ward where skin weight traction was applied on the right leg with four kilograms of water. Formal baseline bloods were taken. An intravenous line was inserted. Doctors suspected Multiple Myeloma as a differential diagnosis. This was the laboratory results for the patient on admission:

Full Blood Count:

Table 1. *Ms. K***'s blood results.*

White cell count	4.95	[4.5-11.0m]
Haemoglobin	8.1 g/dL	[11-16g/dL]
Platelets	429	[150-450]
Urea and Electrolytes:		
Sodium	141	[136-145 mmol/L]
Potassium	5.2	[3.5-5.1 mmol/L]
Chloride	108	[98-107 mmol/L]
Carbon dioxide	226	[22-29 mmol/L]
Urea	3.5	[<8.4 mmol/L]g/dL
Creatinine	47	[64-104 mmol/L]
Albumin	396	[35-52 g/l]
Calcium	2.42	[2.15-2.50 mmol/L]
Total bilirubin	3.1	[0-21]

Direct bilirubin	1.0	[0.3-5.1]
ALT: Alanine aminotransferase	18	[<35]
AST: Aspartate aminotransferase	22	[<32]
ALP: Alkaline phosphatase	189	[35-105]
GGT: Gamma-glutamyl transpeptidase	40	[<40]
TSH: Thyroid stimulating hormone	0.818	[0.5-5.0]
T4: Thyroxine TEST	21.38	[5.0-12.0μ]

Patient was transfused with two units of red blood cells for low hemoglobin. The Bence Jones urine test was also sent to the laboratory to investigate the presence of multiple myeloma. An SPEP (serum protein electrophoresis) was requested from the laboratory. This test is used to measure specific proteins in the blood to help identify some diseases. An electrocardiogram was also done and it showed a sinus tachycardia. A hematologist was consulted to perform a BMAT (bone marrow aspirate and trephine) biopsy. Following the BMAT biopsy the patient went for a right femur core biopsy and two days after that a skeletal survey was done. Multiple myeloma skeletal survey consists of lateral radiographs of the skull, anteroposterior and lateral views of the spine, and AP views of the humerus, ribs, pelvis and femora. Patient's medication on admission included Metformin 850mg twice daily, amitriptyline 25mg nocte, Paracetamol 1g four times daily, tramadol 100mg three times daily, folic acid 5mg daily, ferrous sulphate one tablet daily.

After two weeks of admission the patient was transfused another two units of red blood cells. At the later stage after being diagnosed with multiple myeloma through a biopsy, she was seen by a medical oncologist after a month since admission date. During the consultation with a Medical oncologist, a few observations were made. From the BMAT results, it was found that patient had 53% of plasma nucleated cells, they were pleomorphic. Lymphocytes had 19% of nucleated cells; granulocytes had 23% of neutrophils, metamyelocyte. There were also the presence plasma dyscrasias in the bone marrow specimen. It was noted that the patient had no hypercalcaemia, no delirium and no spinal cord involvement. The medical oncologist ordered that the pathological fracture is fixed. He prescribed Plasmalyte B infusion, Ibandronate 6mg intravenously as a single dose, prednisone 40mg daily, pantoloc 40mg intravenously daily, Bortezomi 2mg on day 1, 8 &15, Lenalidomide 25mg on day 1 to 21, losec 20mg daily, as well as morphine syrup 10mg/5ml. Patient went for cephalomedullary nailing of the right femur. Post operatively the medical oncologist came to see her again and she was counselled regarding Thalidomide. A physiotherapist also came to see the patient and she coped well with isometric quads, heel slides as well as passive mobility to the chair. Patient had to wait for the prophylactic nail on the left femur. Whilst waiting, the hospital palliative team had a meeting with the family of the patient with regards to her condition and prognosis. Doctors were concerned with impending fractures of the left femur and humerus. She was also seen by a dietician who prescribed two sips of Diben® high caloric drink. A single dose of Bortezomib was administered whilst the patient was still waiting for the surgery. Morphine sulphate tablet was added to the patient's analgesic regimen and tramadol was discontinued as per Medical oncologist's prescription. Patient complained of blurred vision and she was referred to the ophthalmologist. Patient was seen by an anesthetist and she prescribed 1 unit of red blood cells to be transfused to the patient and 2 units of red blood cells to be brought with the patient to theatre. Prophylactic nail was eventually done on the left femur. Patient was discharged a week after that operation, the doctors as well as physiotherapist were happy with her progress. She was given an appointment for medical oncology department to continue with chemotherapy as an out-patient. Patient was discharged from the nursing team as well, health education on prevention of pressure injuries at home, to follow up all clinic appointments and to come to hospital if she noticed any abnormalities such as redness and oozing from the wound site.

Patient had reported feeling unwell for the past six months and being unable to bear weight (subjective data). On assessment (objective data) patient had obvious decreased muscle strength, limited range of motion and was unable to ambulate. The nursing diagnoses for this patient on admission were:

Chronic pain related to musculoskeletal impairment and inflammation as evidenced by patient's report of consistent pain.

Impaired physical mobility related to loss of the integrity of the bone structure evidenced by unwillingness to move, decreased muscle strength and limited range of motion.

Anxiety related to anticipation of disease process evidenced by patient verbalizing fear of pain related to dying.

The nursing priorities for this patient were managing pain, immobilization with skin traction, preventing and controlling infection, promoting skin integrity, managing treatment related side effects, providing adequate nutrition, allaying fear and anxiety providing health education and psychosocial support.

Patient was treated by a multidisciplinary team that includes but not limited to, orthopedic surgeons, medical on-

cologists, orthopedic nurses, palliative team that includes a palliative nurse, a social worker and a spiritual pastor, physiotherapists as well as a dietician. Palliative nurses utilize a holistic approach to care for both the physical as well as the psychological, psychosocial and spiritual needs of the patient. These nurses work to maximize the quality life while supporting family members during this difficult time. Orthopedic nurses care for the patients in both chronic and acute stages of orthopedic diseases, assist with increasing mobility and provide education to promote compliance with ongoing treatment, Lippincot Nursing Centre, 2024.

4. Discussion

The purpose of the case study was to address the patient's two main complaints that is; chronic pain as well as impaired physical mobility. The patient benefited from the services of the nursing team by them attending to her pain by elevating the affected limb, maintenance of skin traction, applying hot and cold therapy on the right thigh and administration of analgesic with the collaboration of orthopedic surgeons and medical oncologists. The patient was given health education on the types of pain and types of analgesics. She was advised to report the pain as soon as it started. Also, the involvement of the dietician also assisted the patient as she was getting high protein chocolate and vanilla shakes which promoted the wound healing of the patient. The physiotherapists offered active and passive ROM (Range of motion) exercises on daily bases to the patient. The patient, whilst on skin tractions was taught bed exercises using a monkey chain.

5. Conclusion

Most patients with suspected multiple myeloma exhibit pathological fractures especially on the long bones. These patients often complain of chronic pain which does not resolve with mild analgesic and an inability to walk. Patient spent 60 days in hospital. On admission she had a pain of 8/10 on a pain scale. The analgesic that was administered on her was not helping to reduce pain. She was later put on opiods. After a few days of administration of opiods the patient's level of pain was reduced to 4/10. Antidepressant also contributed to the reduction of the intensity of pain as the patient's sleep pattern was also improved. For altered mobility the patient was only able to sit on a chair with the assistance of the physiotherapist as the doctors were not happy with the weakness of the right femur and they were afraid she might fracture, which eventually did happen. Patient's pain was drastically reduced to 2/10 after the surgery intra-medullary nailing) on the left femur. After getting an operation on the left femur, the patient was able to walk with a walking frame, she was able to transfer herself from bed to a chair and her pain was less than what it was when she first presented to the ward. Her sacral pressure injury had completely healed. Only a scar was visible.

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Conflicts of Interest

There was no conflict of interest whilst conducting the research.

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