Deterioration in general condition secondary to polyarthritis in an elderly patient – a case report

Dr Lara CAMILLERI and Dr Mark FARRUGIA

ABSTRACT

Introduction

Deterioration in general condition is a common presentation in elderly patients. However, it is often a sign of an underlying potentially reversable pathology. As a result, a thorough assessment is often required since it can prove detrimental if left untreated. The following case report gives a clear example of this.

Case Summary

An 83 year old lady was admitted to the acute hospital in view of speech disturbances and lower limb weakness. Her daughter noted an acute on chronic deterioration in general health over the previous weeks. She was found to be hypothermic. The underlying cause was not identified from initial investigations, so she was transferred to a rehab hospital once the hypothermia resolved. She then developed an asymmetrical migrating polyarthropathy involving medium and large joints of the right side of her body. She had a history of gout, so a trial of colchicine was given until blood results were available. She responded significantly and a diagnosis of pseudogout was made.

Conclusion

This is an unusual presentation of pseudogout which often manifests as a monoarticular arthritis. However, multimorbidity and polypharmacy associated with ageing, predispose to atypical presentations of common diseases. In turn, there may be delayed or misdiagnosis leading to inadequate treatment with consequent 'deterioration in general condition'. As a result, a comprehensive geriatric assessment often involving a multidisciplinary team approach is the gold standard management in geriatric medicine.

Key Words

Deterioration in general condition, geriatrics, immobility, atypical presentation, polyarthritis.

INTRODUCTION

'Deterioration in general condition' (DGC) is a common presentation to hospital or clinics amongst people of old age (Aouaneche and Pepersack, 2012). However, this is a broad and non-specific term which may encompass various signs and symptoms. A study conducted by Aouaneche and Pepersack (2012) defined DGC by three main symptoms including asthenia, weight loss and anorexia. More than half the patients admitted with DGC, had an underlying acute medical or surgical pathology and the other 45% had an associated geriatric syndrome (Aouaneche and Pepersack, 2012). This indicates that DGC is often a sign rather than a diagnosis, so the underlying cause should be sought. Moreover, elderly people often have single or multiple chronic diseases associated with polypharmacy, all of which alter the person's physiological response to illness. This may lead to

an unusual presentation of disease, one of which being DGC (Hofman, et al, 2017). This in turn may lead to misdiagnosis and further deterioration with increased risk of hospitalisation and institutionalisation.

The following case report has the following objectives: (i) to highlight how DGC is a sign or symptom rather than a diagnosis; (ii) to raise awareness on how common conditions may present atypically in the elderly; (iii) to raise awareness on hypoactive delirium and (iv) to aid in management planning of polyarthritis in the elderly. Written informed consent for publication of the patient's clinical details was obtained from the patient.

CASE SUMMARY

An 83-year old woman, presented to the emergency department with sluggish speech and lower limb weakness. This was preceded by a two week history of deterioration in general condition which manifested in reduced mobility and functionality. She lived alone but was well supported by her daughter. Pre-morbidly, she mobilised with a stick and was independent in personal activities of daily living. Past medical history included hypothyroidism, chronic kidney disease, congestive heart failure, hypertension, atrial fibrillation, peripheral vascular disease, eczema, diverticular disease, gout and osteoarthritis. Drug history included folic acid 5mg daily, calcium carbonate 500mg daily, allopurinol 100mg alternate days, apixaban 2.5mg twice daily, levothyroxine 50mcg daily and bumetanide 1mg daily. There were no recent changes in treatment.

On admission, she was found to be hypothermic but examination was otherwise normal. A computerized tomography (CT) scan of the brain was normal. In view of her symptoms, a magnetic resonance imaging (MRI) brain was also done which excluded any acute cerebrovascular events. A chest X-ray, serial electrocardiograms (ECGs), and blood tests were also within normal limits, except for kidney failure which was stable compared to previous results. C-reactive protein (CRP) was mildly elevated at 15 mg/l. Thyroid function tests were also normal. Other parameters were stable. She was admitted for active rewarming and intravenous hydration. Bowels were opened regularly, and she did not have any signs of infection or rashes on physical examination. She was noted to have a low urine output and a rising CRP, so urinalysis and urine microscopy, culture and sensitivity were taken. Escherichea Coli was cultivated. However, this was only sensitive to nitrofurantoin, septrin and augmentin which could not be prescribed in view of the low creatinine clearance and penicillin allergy. Moreover, the patient was asymptomatic and the CRP was down trending spontaneously. The patient also reported worsening knee pain since a few weeks before admission. In fact, a knee X-ray was performed where osteoarthritic changes and chondrocalcinosis were identified. However, these were deemed to be chronic in nature and the patient was prescribed paracetamol.

She was eventually transferred to a rehabilitation hospital. Upon transfer, the patient started complaining of neck pain. A cervical spine X-ray was performed and showed severe degenerative changes, osteophyte formation and disc narrowing. The patient denied any headaches, nausea, jaw claudication or visual disturbances and neurological examination was intact. As a result, the neck pain was deemed musculoskeletal in nature, so analgesia with paracetamol and codeine and physiotherapy were prescribed. However, over the next two days, she developed a migrating asymmetrical polyarticular arthritis, where all the large and medium joints of her right side, including shoulder, elbow, wrist, knee and ankle became inflamed, swollen and tender. Small joints were spared. She was afebrile, had no rashes and vital signs were normal. However, the patient's pain was not responding to conventional analgesia and more joints were becoming inflamed. She also reported that since admission to hospital, she was being given allopurinol daily instead of alternate days.

At this stage, the main differential diagnosis, were crystal arthropathy or reactive arthritis but other causes of polyarticular arthritis had to be excluded. As a result, the following investigations were taken:

- Full blood count
- Renal function and electrolytes
- Viral screen including Hepatitis screen, Epstein Barr Virus (EBV), Cytomegalovirus (CMV), Toxoplasma, Human Immunodeficiency virus (HIV).
- Inflammatory markers: CRP and Erythrocyte Sedimentation Rate (ESR)
- Autoimmune screen: Rheumatoid Factor, Antinuclear Antibody (ANA), Antineutrophil Cytoplasmic Antibody (ANCA), Anti-cyclic citrullinated peptide (Anti CCP), Extractable nuclear Antigen (ENA), Anti-ds DNA, Antimitochondrial antibodies (AMA), Anti-smooth muscle antibodies (ASMA), Anti-liver kidney microsomal antibody (LKM), Anti gastric parietal cell antibody (AGPC), Complement (C3, C4), and Serum protein electrophoresis (SPE).
- Creatinine Kinase (CK)
- Uric acid
- Procalcitonin
- Blood cultures
- Urinalysis and cultures
- Thyroid function tests
- Liver function tests

Non-steroidal anti-inflammatory drugs (NSAIDs) were contraindicated in view of her co-morbidities, so a trial of colchicine was started until blood results were available considering her history of gout. Symptoms responded significantly to the colchicine. Blood results revealed the following abnormalities: elevated CRP of 240 mg/L (range 0-5 mg/L), elevated ESR levels of 120 mm 1st Hr (range 33-37 mm 1st Hr), elevated Rheumatoid factor IgM at 151 IU/mL (range 0-15.9 IU/mL), mildly elevated uric acid at 382 umol/l (results before admission were above 420 umol/l), IgA mildly elevated at 5.14 g/l (range 0.70-4.0 g/l) and procalcitonin was also elevated at 0.829 ng/mL (range 0.02-0.046 ng/mL). The other investigations described above were within normal limits.

Consequently, a rheumatology consult was done which concluded that the diagnosis of pseudogout was likely considering the patient's history, marked clinical response to colchicine and the chondrocalcinosis on a previous knee x-ray. It was advised to give a seven-day course of colchicine 0.5mg twice daily and a rheumatology follow-up was organised. The patient's pain resolved, including her knee pain. This allowed her to comply with rehabilitation which enabled her to regain her previous level of functioning and return home.

DISCUSSION

Diagnostic challenges in the elderly

The above case is a typical example of how a common and simple complaint like worsening knee pain can be detrimental to frail elderly people. For instance, no obvious signs of sepsis or biochemical causes for the hypothermia were identified at the emergency department. However, this case occurred during the winter months. The knee pain led to reduced mobility which is a risk factor for hypothermia in the elderly, especially if they do not have proper heating at home. Immobility is also associated with other dangerous consequences including thromboembolism, sarcopenia, falls, increasing frailty, constipation, increased susceptibility to infections specifically pneumonias and urinary tract infections, pressure ulcers, osteoporosis and hypercalcaemia (Guedes, Oliveira and Carvalho, 2018). Immobility will also lead to reduced access to resources especially for those with limited social support, thereby increasing the risk of malnutrition, dehydration and social isolation. Social isolation in the elderly is also associated with sensory deprivation, cognitive decline and possible delirium (Yang, et al, 2009).

This is further complicated by the altered physiological response secondary to age related physiological changes, multimorbidity and polypharmacy, all of which lead to atypical presentation of illnesses (Hofman, et al, 2017). For instance, the patient suffered from both osteoarthritis and gout which have a similar presentation. Moreover, the initial presentation to the emergency department was a stroke mimic with the impaired speech and lower limb weakness. However, this was excluded with MR imaging of the brain. In fact, these symptoms were most likely a manifestation of hypoactive delirium secondary to the pain, immobility and hypothermia.

Confusion and delirium in the elderly

Acute confusion or an altered mental state in the elderly, most commonly occurs secondary to delirium. Delirium results in an acute change in attention, orientation and cognition which fluctuates and occurs secondary to an underlying physiological condition (Yang, et al, 2009). Psychological symptoms might include disorientation, lack of concentration, confusion, hallucinations, language abnormalities, sleep-wake cycle disturbances, restlessness or agitation, reduced mobility or slower movements, change in behaviour, apathy or low mood. Examination findings and physical symptoms depend on the underlying cause (Hosker and Ward, 2017). Moreover, there are different subtypes of delirium. The most commonly mentioned subtypes are those based on the type of psychomotor behaviours, namely hyperactive delirium, hypoactive delirium and mixed delirium consisting of fluctuations between the other two (Gagliardi, 2008).

Hypoactive delirium accounts for around 50% of all subtypes with the mixed type being most common at 80% (Hosker and Ward, 2017). Despite this, hypoactive delirium forms part of the greater proportion of undiagnosed delirium and worse outcome (Gagliardi, 2008; Hosker and Ward, 2017). Misdiagnosis of hypoactive delirium with other causes of cognitive impairment is an important reason of worse outcome. In fact, hypoactive delirium can be easily mistaken for depression or even dementia if the course is protracted (Gagliardi, 2008; Mitchell, et al, 2014). All these can fall under the term of DGC, and one should aim to distinguish between them since two conditions are potentially treatable whereas the diagnosis of dementia carries great stigma and can affect long term planning. The onset and fluctuation of symptoms is a key feature to distinguish between delirium and the other two conditions. However, all three conditions can overlap as highlighted in Table 1 (Gagliardi, 2008; Yang, et al, 2009; Hosker and Ward, 2017).

Hypoactive Delirium, Depression and Dementia

- Cognitive impairment and depression are risk factors for delirium.
- Overlapping symptoms in cognition, mood, and behaviour occur in the three conditions.
- Delirium increases the rate of progression of dementia and may take up to 12 months for delirium to resolve partially or completely.
- Acute events including medical problems, are associated with higher risk of developing depression.
- Dementia is associated with an increased risk of depression.
- A major depressive episode in old age, may exacerbate cognitive impairment and increase the risk of developing dementia.

Table 1: Hypoactive Delirium, Depression and Dementia

Locally the Mini Mental State Examination (MMSE) is a popular tool to assess cognitive impairment. However, this will only indicate the presence or absence of cognitive impairment, but it will not give you the underlying cause, so it is not adequate to distinguish between the three (Mitchell, et al, 2014). The National Institute of Care and Excellence (NICE) delirium guidelines recommend the use of the DSM-V criteria on which multiple assessment tools have been developed including the Confusion Assessment Method and 4AT scores which are more specific to diagnose delirium (Grover and Kate, 2012).

Comprehensive Geriatric Assessment

Cognitive assessment is part of the comprehensive geriatric assessment (CGA) which is the gold standard assessment in geriatric medicine. It incorporates various components including medical, physical, psychological, psychiatry, socioeconomic, functional and nutritional assessments (Parker, et al, 2018). History taking and physical examination are often the first steps of a CGA. A collateral history is often required in those who

have cognitive impairment or communication problems. If done properly, these can often be enough to reach a diagnosis without requiring further investigations. However, this might be difficult in elderly people, especially those who present atypically. In fact, the history and examination will often enable us to formulate a differential diagnosis or a problem list of multiple issues. More often than not, these cannot be managed simultaneously so continuous review and re-assessment is necessary, with possible involvement of other health care professionals.

This is highlighted in the case discussed. For instance, a collateral history was taken from the patient's daughter at the emergency department which reported the acute onset of symptoms, pointing towards a diagnosis of delirium or an acute medical problem as opposed to dementia. Moreover, the history was also useful in identifying a diagnosis of the polyarticular arthritis upon transfer to the rehabilitation hospital. The patient had an established diagnosis of gout which was based on one acute attack involving her first metatarsophalangeal joint two years previously. Gout does not typically present as a polyarticular arthritis but rather as a monoarticular arthritis. This applies for pseudogout, but it differs clinically from gout with regards to the most common joint involvement. For instance, gout affects mostly metatarsophalangeal joints while the knee joint is the most common joint involved in pseudogout (Sidari and Hill, 2018). As a result, the worsening knee pain which was not responding to conventional analgesia before admission which led to DGC, was most likely the primary and typical presentation of pseudogout. Moreover, the patient also reported a medication error where higher doses of allopurinol where prescribed upon admission to hospital. Allopurinol is a xanthine oxidase inhibitor used as a uric acid lowering agent. Although these should be continued during an acute gout attack if the patient was already taking them, any acute reduction in serum uric acid can precipitate or prolong an acute gout attack (Abhishek, Roddy and Doherty, 2017). As a result, the increased doses of allopurinol might have resulted in an acute reduction in serum uric acid which was also evident in biochemical results. This medication error coupled with the untreated acute attack, the patient's co-morbidities, polypharmacy and acute events might have led to the atypical more diffuse joint involvement of pseudogout.

Differential diagnosis of polyarthritis

There are multiple pathologies other than pseudogout, that typically present as a polyarticular arthritis, so these had to be excluded. Table 2 describes different causes of arthritis and their clinical presentations (Baron, Lee and Keystone, 1982; Amezcua-Guerra, et al, 2013; Lahu, et al, 2015; Pujalte and Albano-Aluquin, 2015; Abhishek, Roddy and Doherty, 2017; Sidari and Hill, 2018; Freilich and Larsen, 2018; Alpay Kanites, Celik and Bes, 2019; Salehi-Abari, 2020; Mandi, O'Dell and Romain, 2022; King, Flaherty and Finley, 2022). When clinical signs and symptoms are not enough, further investigations might help the clinician reach a diagnosis.

Table 2: Differential Diagnosis of Arthritis and Clinical Presentation (Part 1)

		*Amount of joint involvement			Symmetry of joint involvement		**Type of joint involvement			*** Onset		**** Progression			Specific joints involved	Other clinical manifestations
		Mono (1)	Pauci (2-3)	Poly (>4)	Symmetrical	Asymmetrical	Small	Medium	Large	Acute	Chronic	Migratory	Additive	Intermitten		
Connective Tissue Disease	Rheumatoid Arthritis (RA)			X	x		x x	x	x	x	x		X		Metacarpophalangeal and interphalangeal	Rheumatoid nodules and joint deformities. Fevers, uveitis, Lung fibrosis
	Systemic Lupus Erythomatosis (SLE)			x	x		x x	x	x	x	x	x			Knees, carpal joints, joints of fingers especially proximal interphalangeal joints	Malar rash Oral ulcers Kidney and lung involvement Drug history due to drug induced lupus
	Scleroderma (SSc)	X	x	x x	x		x x				x			X	Distal interphalangeal joints, first carpometacarpal joint, metacarpal and metatarsal joints	Limited SSc p/w CREST Syndrome Diffuse SSc p/w skin thickening, renal crisis and cardiac involvement Sclerodactyly Raynaud's Phenomenon
	Adult Still's disease		x	x	x		X	x	x	x			X		Wrist, knees and ankles	Fever Evanescent, macular, salmon-pink rash.
	Sjogren's			x	x	x	X	x		x				X	Metacarpophalangeal joints, knees, ankles, shoulders and metatarsophalangeal joints	Arthralgia Keratoconjunctivitis sicca Xerostomia
	Sarcoid			x	x			x		x	x	x	X	X	Ankle joints	Erythema nodosum Acute uveitis Lung involvement
Crystal Arthropathy	Gout	X				X	X		X	X		X			First metatarsophalangeal joint or knees.	Appearance of dactylitis/cellulitis. Gout tophi
	Acute Calcium Pyrophosphate Crystal Deposition (pseudogout)	X		x		x	X	x	x	x		x		x	Knee joints. Upper extremity site as an initial site of inflammation should raise the suspicion	Polyarticular attacks tend to be accompanied by low grade fever.
Vasculitis	Polymyalgia Rheumatica (PMR)		x x	x	x		X	x	x x	x			X	x	Shoulders, Neck and Pelvic girdle	Arthralgia and morning stiffness/stiffness. Low grade fever. Giant cell arteritis with temporal headaches and tenderness. Monocular visual loss.
	Polyarteritis nodosa			x	x		X	x	x	x	x		X		Ankles (joints below the knees)	Rash, gangrene, proteinuria, hematuria hemoptysis, gastrointestinal tract bleeding, stroke, headache, wrist drop. Affects small and medium sized vessels.
	Hanoch Shonlein Purpura (HSP)		x			x			x	x		x		x	Hips, knees, and ankles	Purpuric rash Renal Impairment Affects small vessels
	Granulomatosis with polyangiitis		x	X	x	x	X	x	x	x	x	x	X		Knees and ankles but also small joints of the hands	Charge Strauss- asthma, intermittent lung infiltrates, hypereosinophilia with eosinophilic vasculitis effecting skin, nervous system, and internal organs. Wegener's granulomatosis presents with fever, fatigues, weight loss and reduced appetite with vasculitis causing rash and effecting musculoskeletal and central nervous systems, ear, nose and throat, and internal organs.

Table 2: Differential Diagnosis of Arthritis and Clinical Presentation (Part 2)

		*Amount of joint involvement			Symmetry of joint involvement		**Type of joint involvement			*** Onset		**** Progression			Specific joints involved	Other clinical manifestations
		Mono (1)	Pauci (2-3)	Poly (>4)	Symmetrical	Asymmetrical	Small	Medium	Large	Acute	Chronic	Migratory	Additive	Intermittent		
Spondyloarthropathies	Ankylosing spondylitis		X			X		x	x x		x		X		Mainly spine and sacroiliac joints.	Uveitis Pulmonary fibrosis. Back pain improves with exercise.
	Psoriatic arthritis		x			x	X	x	x	X	x		X		Sacroiliac joints, distal and metatarsophalangeal joints	Psoriatic skin rash Uveitis
	Reactive arthritis		x			X	X	x	x x	x		x	X		Knees	Triad of uveitis, urethritis and enteritis
	Inflammatory bowel disease		x x	X		x	x	x	x x	x		x		X	Knees, ankles, wrists, elbows and hips	Signs and symptoms of Crohn's disease and Ulcerative colitis.
	Polyarticular Juvenile idiopathic arthritis			X	x		x x				x		X		Temporomandibular joint	Pain Joint destruction, osteopenia and osteoporosis. Temporomandibular joint involvement leading to micrognatia, Uveitis and internal organ involvement. Salmon-colored evanescent rash and fever.
Infectious	Bacterial	X				x			x	x		x	X		Knee (50% of cases), hip, shoulder, ankle and wrist.	Fever Pain
	Viral			x	x					x		x	X		Knees	Rash Fever
Other causes	Osteoarthritis	x	x	x		x	x		x		x		X		Interphalangeal joints, first carpometacarpal joint, first metatarsophalangeal joint, knees, hips and facet joints of the lower cervical and lower lumbar spine.	Heberden nodes. Morning stiffness lasts for less than 30 minutes.
	Endocrine disorders		x	x	x	x	x	x	x	x			X		Hands and knees in hypothyroidism, shoulders in hyperthyroidism, ankylosing spondylitis like disease in hypoparathyroidism, Charcot's Arthropathy (foot) in diabetes mellitus	Arthralgia and morning stiffness. Myxedematous arthropathy Synovial thickening, ligamentous laxity and effusion. Signs and symptoms of hypo/hyper-thyroidism
	Malignancy	Adenocarcinoma of the lung, mesotheliomas, and lymphomas have been associated with the development of hypertrophic pulmonary osteoarthropathy manifesting in periostitis of hands and ankles) Lung cancer can present with Jaccoud–like arthropathy manifesting as chronic, rheumatoid like, non-erosive deformities of the hand. Colon cancer and multiple myeloma may be manifest with pyogenic arthritis. Paraneoplastic syndromes can present as remitting seronegative symmetric synovitis with pitting edema. Patients with pancreatic cancer can manifest with an amalgamation of arthritis and panniculitis. Thymoma can manifest as a lupus-like syndrome.														

* Amount of joint involvement:
Monoarthritis = 1 joint, pauciarthritis = 2-3 joints, polyarthritis = more than 4 joints.
** Types of joint involved:
Small joints = metatarso and metacarpo phalyngeal joints, ankle and wrist; medium = elbow and knees; large = hips, shoulders, sacroiliac and spine.
*** Onset: Chronic = present for more than 6 weeks; acute = present for less than 6 weeks.
**** Progression:
Intermittent = Same joint involvement in different attacks and symptoms resolve completely between attacks.
Migratory = Joint symptoms during a particular attack resolve and appear in a different joint in subsequent attacks.
Additive = Joint symptoms persist after attack with involvement of new joints in subsequent attacks.

Table 3 describes the type of investigations indicated in arthritis, together with their findings and clinical relevance (Baron, Lee and Keystone, 1982; Amezcua-Guerra, et al, 2013; Lahu, et al, 2015; Pujalte and Albano-Aluquin, 2015; Abhishek, Roddy and Doherty, 2017; Sidari and Hill, 2018; Freilich and Larsen, 2018; Alpay Kanitez, Celik and Bes, 2019; Salehi-Abari, 2020; Mandi, O'Dell and Romain, 2022; King, Flaherty and Finley, 2022).

Table 3: Investigations of Polyarthritis

3.1 – BIOCHEMICAL INVESTIGATIONS	
Complete blood count	Cytopenias in systemic lupus erythematosus (SLE) Eosinophilia in Churg Straus Vasculitis Polycytemias in myeloproliferative disorders Anaemia in chronic arthritis
Erythrocyte Sedimentation Rate (ESR) and C-Reactive Protein (CRP)	Non-specific and can be elevated in infection, inflammatory conditions and malignancy. CRP usually normal in systemic lupus erythematosus.
Rheumatoid Factor	Rheumatoid Arthritis Systemic Lupus Erythematosus Sjogren's Vasculitis Chronic infections May be positive in malignancy
Antinuclear Antibody (ANA) including titre and pattern	Systemic Lupus Erythematosus Polyarticular juvenile idiopathic arthritis Sjogren's Scleroderma May be positive in healthy females Malignancy
Extractable nuclear Antigen (ENA) – indicated if ANA positive	Systemic Lupus Erythematosus Sjogren's Scleroderma

Anti-ds DNA	Systemic Lupus Erythematosus
Antineutrophil Cytoplasmic Antibody (ANCA)	Rheumatoid Arthritis Vasculitis p-ANCA: Churg Strauss and microscopic polyangiitis c-ANCA: Wegener's granulomatosis
Anti-cyclic citrullinated peptide (Anti CCP)	Rheumatoid Arthritis (High specificity)
Antimitochondrial antibodies (AMA)	Sjogren's Systemic Lupus Erythematosus Autoimmune hepatitis Primary biliary cirrhosis Myocardial dysfunction Chronic infections
Human Leukocyte Antigen (HLA)	HLA B-27 positivity in Ankylosing spondylitis
Anti-Ro ant Anti-La	Sjogren's
Anti-Smith antibodies	Systemic Lupus Erythematosus
Anti-Scl 70 antibodies	Scleroderma
Serum Angiotensin converting enzyme (ACE)	Elevated in Sarcoidosis
Anti-smooth muscle antibodies (ASMA)	Autoimmune hepatitis
Complement (C3/C4)	Elevated in Systemic Lupus Erythematosus
Immunoglobulins (IgA, IgG, IgM)	Elevated IgA in Henoch Schoenlein Purpura
Creatinine Kinase (CK)	Polymyositis Dermatomyositis
Lactate Dehydrogenase (LDH)	Autoimmune haemolytic anaemia Malignancy Myositis Adult Still's disease
Procalcitonin	Bacterial infections Pseudogout Still's disease Vasculitis
Serum Uric Acid	Gout Pseudogout

3.2 – URINALYSIS	
Proteinuria	Systemic Lupus Erythomatosis Vasculitis
Confirmation of a urinary tract infection: Leukocytosis +/- nitrites or positive culture and sensitivity.	Septic arthritis Reactive arthritis
3.3 – RADIOLOGICAL INVESTIGATIONS (X-RAY FINDINGS)	
Bone erosions	Rheumatoid Arthritis Still's disease Scleroderma Gout Psoriatic arthritis Polyarticular Juvenile idiopathic arthritis Bacterial Septic Arthritis Osteoarthritis
Chondrocalcinosis	Acute Calcium Pyrophosphate Crystal Deposition (Pseudogout)
Bone cysts	Sarcoid Gout Osteoarthritis
Sacro-ilitis	Ankylosing spondylitis Psoriatic Arthritis
Osteophytes	Osteoarthritis
Apical lung fibrosis	Spondyloarthropaties Tuberculosis
Hilar lymphadenopathy on Chest X-Ray	Sarcoidosis
3.4 – TISSUE HISTOLOGY	
Temporal arteritis	Giant Cell Arteritis and Polymyalgia Rheumatica
Non-caseating granulomas	Sarcoidosis
Colonoscopy	Inflammatory bowel disease
Eosinophilic Vasculitis affecting small to medium sized vessels	Charge Strauss
Necrotizing granulomatosis with pauci immune vasculitis in small and medium sized vessels	Wegener's granulomatosis

3.5 – SYNOVIAL FLUID ANALYSIS	
Gram stain and culture	Bacterial septic arthritis
Crystals	Negatively birefringent crystals in gout Positively birefringent crystals in pseudogout
White cell count and polymorphonuclear leukocyte count	Moderate raise (2000-50000 per mm^2 and 25-75%): Inflammatory arthritis Significant raise (>50000 per mm^2 and >90%): Septic joint

Management of polyarthritis in the community

At a community level, investigations are often limited to blood tests and plain radiographs. Moreover, access to certain blood investigations is limited to rheumatology or other specialists. For instance, it is important to distinguish between inflammatory and infectious causes of arthritis. Definite diagnosis is achieved by joint aspiration, culture and sensitivity. However, this is not always practical nor feasible to achieve in primary care. Moreover, both conditions will lead to raised CRP and ESR which are more easily accessible. An alternative blood test is the procalcitonin which is a specific serum marker where levels above 0.5 ng/ml were proven to be a reliable indicator for the presence of an acute bacterial infection (Vasishta and Patel, 2019). Consequently, it is often used to differentiate infection from inflammation. However, there were reports of elevated procalcitonin levels associated with inflammatory processes including acute pseudogout attacks, vasculitis and Still's disease (Vasishta and Patel, 2019). In fact, this patient had an elevated procalcitonin level above 0.8 ng/ml, despite the absence of acute bacterial infections. Moreover, Table 3 illustrates that most investigations are not specific to a particular condition but rather can be positive in multiple forms of arthritis. As a result, these need to be used in combination with the clinical picture.

Moreover, in the community setting, it might be more difficult to organise investigations, so results will not be available immediately and treatment might need to be initiated in the interim, especially if the signs are impacting the patient's quality of life. This leads us to the concept of risk assessment and patient centred care in geriatric medicine. For instance, the definite diagnosis of pseudogout is achieved by synovial fluid from joint aspiration showing positively birefringent, rhomboid-shaped crystals (Sidari and Hill, 2018). However, this is an invasive procedure with risk of bleeding and infection. These risks were multiplied in this patient who was on anticoagulation for atrial fibrillation and the risks of stopping the anticoagulation outweighed the benefit of carrying out the investigation. Moreover, colchicine is quite a safe drug when the dose is adjusted for kidney function where the most common side effect is gastrointestinal upset (Abhishek, Roddy and Doherty, 2017). As a result, the benefit of giving a trail of colchicine outweighed the risks in this particular case considering the severe pain, functional impairment and history of gout.

In this particular case, although several investigations were taken, they were not essential to reach a diagnosis of gout. The history was the most helpful part of the assessment for diagnosis. However, conditions other than osteoarthritis, fibromyalgia and gout often require specialised rheumatological treatment, so referral is often indicated. The dilemma lies on the urgency of the referral. There are only few rheumatological conditions that require emergency care as shown in Table 4 and often have extra-articular manifestations (Gutiérrez-González, 2015). Moreover, articular symptoms are often chronic in onset but can be very disabling. In fact, the whole clinical and social picture should be considered when choosing how and where to refer. The impact of the condition on the patient's functionality and coping skills at home should be taken into account. If in doubt, phone consultations with a specialist rheumatology could help in making such a decision or commence any treatment until review at the specialist clinic is arranged.

Table 4: Indications for Referral

ELECTIVE SPECIALIST CARE	EMERGENCY DEPARTMENT
Gout, osteoarthritis and fibromyalgia not responding to conventional treatment. Diagnostic difficulty Connective tissue disorders Vasculitis Spondyloarthropathies	Central nervous system vasculitis Catastrophic antiphospholipid syndrome Septic arthritis Pulmonary renal syndrome Macrophage activation syndrome Always refer acute arthritis associated with fever or hypothermia. Acute Polyarthritis Arthritis associated with acute organ failure Visual or neurological disturbances Coagulation abnormalities Malignancy suspected

CONCLUSION

The objectives of this article were reached since the above case is a clear example of a common aetiology of arthritis which presented atypically in an elderly patient, leading to delayed diagnosis with consequent DGC and hospitalisation. It also highlights the importance of hypoactive delirium as a common cause of DGC in the elderly. Moreover, it emphasises that complex investigations are not always essential to diagnose and treat arthralgia in the elderly, especially if a good history and thorough examination are done.

Joint pains is a common presentation in elderly people where the initial presentation often occurs at a community level. However, the causes can be multiple ranging from benign to sinister pathologies. The initial steps should include establishing the onset (acute, chronic or acute on chronic) and the number of joint involvement (mono, pauci or poly articular). It is also essential to distinguish between inflammatory and non-inflammatory condition to help achieve a diagnosis.

However, clinical diagnosis may be difficult to achieve in elderly people with multimorbidity where the joint pain can be easily misattributed to an established condition. Consequently, it is essential to monitor response to treatment and seek an alternative diagnosis if symptoms persist or worsen. This is especially important if the symptoms are impacting the patient's functionality and quality of life leading to detrimental consequences if adequate treatment is delayed.

Elderly people should not fall victims of time constraints during busy clinics and a comprehensive geriatric assessment is indicated to help reach a diagnosis and form an adequate management plan which should include adequate follow-up and monitoring instructions. Moreover, liaison with other health care professionals will enable a holistic patient centred care.

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Dr Lara CAMILLERI
M.D. (Melit), MRCP (London), Dip. in Geriatric Medicine (London), MRCP Geriatrics, MSc Care of the Elderly (Wales)
Higher Specialist Trainee in Geriatric Medicine, Karin Grech Hospital, Malta
Email: lara.b.camilleri@gov.mt

Dr Mark FARRUGIA
M.D. (Melit)
Foundation Year Doctor, Mater Dei Hospital, Malta
Email: mark.farrugia.2@gov.mt