PERIOPERATIVE MANAGEMENT OF PATIENTS WITH PSORIATIC ARTHRITIS: CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Background: This paper aims to explore the assessment of patients with psoriatic arthritis before undergoing orthopaedic surgery. Perioperative assessment starts with early diagnosis of the patient's medical condition, overall health, medical co-morbidities, and the assessment of the risk factors associated with the proposed procedures. This allows for assessment and prevention of postoperative management of complications. Role of the management of drugs used for psoriasis such as Disease-Modifying Anti-Rheumatic Drugs (DMARD) and anti-platelets, and corticosteroids is also important.

Perioperative assessment enables the discussion of the proposed treatment plans and the factors associated with them in each case among the different specialists involved to facilitate an appropriate early decision-making and better treatment outcomes. This article will review components of perioperative medical evaluation, discusses perioperative management of comorbidities and the management of specific clinical problems related to psoriasis. The article will tackle the management of DMARDs and biologic therapies, glucocorticoids, prophylactic antibiotics, and postoperative follow up, including patient education and rehabilitation.

Case presentation: We report the case of a 32 year old lady on treatment for skin psoriasis and arthritis who presents with bilateral hip pain. Investigations reveal grade 2 avascular necrosis of femoral head on magnetic resonance imaging. She also had dyslipidemia, obesity and osteoporosis that may be the consequence of long term steroid use. We discuss the perioperative management of this patient.

Conclusion: Psoriatic arthritis (PsA) is a chronic inflammatory arthropathy. Arthropathy with severe structural damage in these patients may be treated successfully with surgery. There is paucity of data as few large-scale, high quality trials have been conducted. Postoperative infection remains a prominent concern, although debate regarding the true risk of infection is ongoing. Collaboration with dermatologists, rheumatologists and orthopaedic surgeons is essential to the successful surgical treatment of PsA.

Key words: Psoriatic arthritis, Perioperative period and management, Total hip arthroplasty

INTRODUCTION

Psoriatic arthritis is a seronegative inflammatory arthritis associated with psoriasis. The prevalence of psoriasis is about 1 to 3% in general population whereas that of psoriatic arthritis is 0.3-1% (1, 2). African studies, nearly all of which were done in dermatology departments, found prevalence's of 0.05 to 0.9% in West Africa and 2.8 to 3.5% in South Africa. The prevalence of psoriasis seems to have increased markedly in the human immunodeficiency virus (HIV) era (5.15% among HIV-positive individuals) (3). Management for psoriatic arthritis includes drugs and surgery. Synovectomy may be considered in a patient who is disabled by refractory arthritis in a single joint. Joint replacement surgery is routinely performed on patients with severely damaged hip or knee joints. This improves the patient's functional ability and quality of life. Other procedures include resection of metatarsal heads and arthrodesis.

Perioperative assessment is important before the surgical procedure and it goes beyond the usual cardiovascular and pulmonary risk assessments. Proper medical evaluation and care of psoriatic patients prior to surgery calls for cooperation between dermatology, rheumatology and orthopaedic departments to ensure patients get the best possible care. Perioperative assessment can affect the postoperative care as it

identifies the conditions to pay attention later on. Drugs such as Disease-Modifying Antirheumatic Drugs (DMARDs), corticosteroids, anti-platelet agents and Venous Thromboembolism (VTE) prophylaxis must also be managed appropriately.

In the absence of clear guidelines for the care of a patient with rheumatic diseases undergoing orthopaedic surgery, management must be tailor made to each patient depending on comorbidities. This will ensure favorable patient outcomes, reduction in hospital stay, and maximum utilization of resources. Ideally, perioperative medical evaluation should start several weeks before elective surgery but, in some cases, time may not be available for situations requiring emergency surgery, such as in acute fractures (4).

The preoperative medical evaluation: Clinicians should pay attention to the systemic inflammatory nature of PsA and increased all-cause mortality in PsA patients when considering surgical management. Pre-operative history and physical examination should be concise and detailed. The history should contain particulars important to patients with psoriasis. This includes the patient's age, duration of disease, current functional status, specific joint involvement, any extra-articular manifestations of disease, current medications including previous use of steroids, previous complications associated with surgery, and any co-morbidity. Special emphasis should be given to musculoskeletal issues during the physical examination, especially posture, location of joint involvement, gait, and range of motion of the examined joints. Psoriasis has been strongly associated with obesity, which in turn increases the risk of surgical site infection and deep vein thrombosis. Psoriasis is also associated with risk factors for metabolic syndrome: abdominal obesity, high levels of triglycerides, low levels of high density lipoprotein cholesterol, elevated blood pressure, and elevated fasting glucose (5). Psoriasis is an independent risk factor for myocardial infarction (6). Preoperative assessment should include careful evaluation of cardiac status in those at-risk patients, according to the recommendations of the American College of Cardiology and the American Heart Association. Stress testing may be indicated when patients are unable to exercise vigorously. One should consider beta blockade so as to decrease pulse and oxygen demand, thus diminishing cardiac risk (7). Medical treatment of PsA has been revolutionized by biologic therapy and these drugs pose a new concern in the perioperative setting. Tumour necrosis factor alpha (TNF-α) plays an important role in response to infection and may play a role in wound healing.

Cervical spine disease needs to be evaluated. At least plain radiographs should be ordered. Symptomatic patients should undergo detailed evaluation with Magnetic Resonance Imaging (MRI) and spine surgeons' opinion. If significant disease, first stabilization of the cervical spine should be considered. Careful handling and fibreoptic endoscopy may be advised. Assessment of skin disease at the surgical site is important. Incisions should not involve psoriatic lesions since they are associated with increased infection. Pre and post rehabilitation should be intensive as they have been associated with better outcomes.

Preoperative optimization

Investigations should add value by assessing the disease activity and baseline tests which will be useful during the perioperative period. Tests that can be done include the following:

(i) A complete blood count (CBC) for an examination of possible anaemia due to gastric or duodenal irritation, leukopenia and/or bone marrow suppression. This is also important in our patient who will undergo hip replacement and we anticipate significant blood loss.
(ii) A renal profile and liver enzymes.
(iii) A urinalysis and urine culture if pyuria.
(iv) A 12-lead electrocardiogram (ECG) is recommended in males over the age of 40 years and females over 50 years having major surgery, even in the absence of history or physical exam findings (8,9). Patients will probably have to undergo a stress ECG and echo to assess their cardiac fitness. Psoriasis is associated with risk factors for metabolic syndrome. This could accelerate atherosclerosis putting psoriatic arthritic patients at high risk for cardiac morbidity and mortality.
(v) Chest X-ray is indicated for patients over the age of 50 years undergoing major joint or spine surgery, even if there is no evidence suggesting active pulmonary disease (10).

Perioperative assessment of medical co-morbidities: Minimization of risks can help decrease surgical morbidity and mortality (11).

Perioperative pharmacology

Recommendations on DMARDS: There are no definitive studies on the guide to drug management in the perioperative period. Perioperative adjustment of disease modifying drugs and biologics needs to be done. Based on current evidence, methotrexate may be continued perioperatively. Leflunomide has been shown to be associated with increased perioperative infections in some studies hence may be discontinued at least 2 weeks preoperatively. Current guidelines such as the American College of Rheumatology and the British Society for Rheumatology suggest that with-holding of biologic agents pre-operatively based on half-life; etanercept should be held for 2 weeks, adalimumab for 3 to 4 weeks, and infliximab for 6 to 8 weeks. Biologic agents are typically restarted following surgery, after the stitches have been removed and the wound is

healing well without drainage or erythema, usually by 2 weeks postoperatively (12).

Recommendations on steroids: Cortisone has been widely used for the treatment of inflammatory diseases such as Rheumatoid Arthritis (RA). Shortly after its introduction, cases of adrenal insufficiency in patients maintained on cortisone were reported, and a practice of administering supraphysiologic doses during times of stress was adopted.

Previously common clinical practice was to administer Stress Dose Steroids (SDS) to patients who have been on low-dose corticosteroids for ≥6 months or patients who have been on intermediate to high doses for greater than 3 weeks. Results of various studies suggest that it is very difficult to predict who is truly at risk for adrenal insufficiency based on steroid dosage or length of treatment. Furthermore, steroid therapy has been shown to increase infection rates and impede wound healing (13).

Due to the lack of good prospective data, conclusive recommendations regarding the use of SDS in steroid-treated PsA patients undergoing orthopaedic surgery are difficult to make. Patients on low dose (i.e., ≤7.5 mg/day) or on any dose of steroids for <3 weeks should be continued with their usual daily dose of corticosteroids perioperatively. There appears to be no need to add SDS in these patients unless specific clinical events or additional risk factors suggest their need. The usefulness and feasibility of Adrenocorticotropic hormone (ACTH) stimulation testing is unclear, and the benefit of SDS seems minimal in these patients.

For patients who have been on more than prednisolone chronic moderate- to high-dose therapy (≥20 mg/day prednisone for ≥3 weeks), most physicians would assume secondary adrenal suppression and should undergo a moderate stress procedure. Thus stress dose steroids in the form of hydrocortisone 50 mg IV, then postoperatively 20mg IV every 8 hours for 3 doses. The pre-operative dose of the patient is to be resumed on post-operative day 2 (14).

In patients on intermediate doses (i.e., 7.5–20 mg daily), the available data suggest that we are greatly overusing supraphysiologic steroid doses in the perioperative setting. We therefore recommend that SDS should not be routinely prescribed, but should be tailor made for each patient. It should be individualized based on the chronicity of steroid treatment, the estimated stress of the surgery, and the presence of additional risk factors that may increase postoperative complications and infection risk (risk factors are anaemia, hypoalbuminemia, other immunosuppressants, and diabetes).

Recommendations on VTE prophylaxis: Total joint arthroplasty is considered a risk factor for postoperative venous thrombosis. The risk is even higher in patients with autoimmune diseases. This benefit of VTE prophylaxis is associated with increased risk of minor bleeding, but with no excess major bleeding. This can be reduced by giving regional anaesthesia as it has been shown to reduce the postoperative Deep Venous Thrombosis (DVT) significantly (15).

Recommendations on antibiotics prophylaxis: Antibiotic prophylaxis is needed for psoriatic arthritis patients who will be undergoing long procedures especially patients with total knee replacement, joint replacement and prosthetic joints to prevent surgical site infections. Patients undergoing surgery in an infected area with a high risk of bacteremia should be administered antibiotics. Third generation cephalosporins are the drugs of choice, and should be given 30 to 60 minutes before skin incision (15, 16). Vancomycin may be used for patients with a confirmed ß-lactam allergy; it should be started within two hours prior to incision. Additional intraoperative doses of antibiotic should be used for prolonged procedures and if there is significant blood loss during the procedure. Prophylactic antibiotics should be stopped within 24 hours of the end of surgery (15, 16). Antibiotic-impregnated cement should be considered for large joint arthroplasty (16).

Disease activity: Dermatologists should be involved in the preoperatively management of these patients especially those with active skin disease. Every attempt should be made to manage skin plaques before surgery to decrease bacterial burden. Contamination of the surgical site can be avoided by not operating directly through active skin lesions; surgery should be postponed or incision sites should be modified to avoid incising through a psoriatic plaque. Operation through a psoriatic plaque is only done when absolutely necessary.

Outcomes of surgery

There is paucity of data of outcomes and complications of orthopaedic procedures performed in patients with psoriasis. Majority of these studies are small and retrospective. Postoperative infection stands out as a prominent concern. Patients with psoriatic arthritis are at increased risk of developing infections. The increased risk seems mainly due to the immunosuppressive disease modifying drugs and use of systemic steroids for extended periods. Periprosthetic joint infection still remains the leading cause of revision after total knee arthroplasty ranging from 0.4 to 4.0%. Following total hip arthroplasty it is the third most common complication afflicting 0.3 to 2.2% (17, 18). Menon *et al* (19) retrospectively reviewed 55 Charnley low-friction hip arthroplasties performed in 38 patients with psoriasis. They observed a high rate of infection of 9.1% superficial and 5.5% deep. They concluded that perioperative antibiotics, which were not used in their study, are warranted when treating patients with

psoriasis. In a review of 27 total knee arthroplasties performed in 18 patients with psoriasis by Stern *et al* (20) found that deep infections occurred in 16.6% of knees and revision in 21%. The study population had eight patients who had psoriasis with osteoarthritis, seven had PsA, and three had RA. Sixteen patients were followed-up. Notably, perioperative intravenous antibiotics were used in this study, but the authors did not indicate whether antibiotic-impregnated cement was used (20). In a study of 50 primary total knee replacements performed in 34 patients with psoriasis Beyer *et al* (21) reported complications. These included deep infection (1 case), deep vein thrombosis (1 case), pulmonary embolism (1 case), ileus (1 case), and exacerbation of psoriasis (2 cases). The authors concluded that there was no increased risk of infection in the psoriasis population. Lambert and Wright (22) reviewed complications in 21 patients with psoriasis who had undergone 41 orthopaedic procedures. All but one patient had PsA. They reported one infection and three Koebner phenomena (ie, psoriatic outbreak after trauma).

Obese patients are at higher risk of periprosthetic joint infection after Total Hip Arthroplasty (THA) (23). Patients with a body mass index more than 20% of their ideal weight are also at increased risk of developing an infection due to "paradoxical malnutrition" (24). Although obesity is frequently difficult to modify, weight reduction prior to elective arthroplasty should be recommended to minimize periprosthetic joint infection. Role of malnutrition as risk factor for infections is controversial. Greene *et al* (24) reported that preoperative lymphocyte count of less than 1500 cells/mm^3 was associated with five times greater frequency of developing a major wound complication and an albumin level of less than 3.5 g/dL had a seven times greater risk. There is paucity of data on full benefits of preoperative nutritional repletion of malnourished patients in reducing SSI risk. Randomized clinical trials would be necessary to determine if nutritional support alters SSI risk in specific patient-operation combinations.

What is the patient satisfaction post-surgery? Belsky *et al* (25) reviewed 25 patients with confirmed PsA who had undergone a variety of hand or wrist procedures. Wrist involvement was treated with arthroplasty, fusion, or distal ulnar resection and limited range of motion was achieved compared with range of motion in RA patients. The authors concluded that stiffness, which is both an indication for surgery and a factor that adversely affects outcome, was the major clinical problem in the hand and wrist. Hicken *et al* (26) did a 15 year retrospective review of 17 patients with PsA who had undergone 27 foot and ankle procedures. Twenty-four of 27 procedures (89%) were considered successful; these patients did not require additional intervention, did not display clinical progression of disease, and were satisfied with the results of the procedure.

CASE DISCUSSION

A 32 year old female patient known to have skin psoriasis for 10 years presented with bilateral hip pain. She had been on steroids for psoriasis for unknown duration of time. The hip pain was of insidious onset on the right and later progressed to involve the left hip. The pain progressively worsened in intensity and duration and aggravated in the night, mornings and getting up from sitting or sleeping positions. It was associated with progressively worsening morning stiffness. The pain was initially relieved with pain killers and activity like walking. Currently she is unable to get up from bed and has lower back pain. The lower back pain is dull, intermittent initially worse in the mornings with an associated worsening of morning stiffness. She also noted intermittent hip muscle spasms during the same period. The skin psoriasis has been a challenge to manage due to allergic and hypersensitive reactions to the various medicines. This forced the dermatologist to start her on steroids to control the disease. She has now developed adverse effects of the steroids which include obesity, osteoporosis and dyslipidemia. Her blood pressure and sugars have remained within the normal limits. Examination on admission revealed a young obese lady in pain with psoriasis distributed on the legs, arms, face and chest. Examination of the right hip revealed tenderness at the hip with limb that was abducted and internally rotated. MRI of the hip showed grade 2 avascular necrosis of femoral head. The orthopaedic team recommended total hip replacement.

Our patient still has active psoriasis so the surgery will have to be elective and once the disease is under control. Reviews by the dermatologist and rheumatologist are also important. She will have to continue with methotrexate as it's not associated with an increased risk of infection nor does it interfere with wound healing or increased rates of flare.

Total Hip Replacement (THR) is a major surgery especially in psoriatic arthritis patients. The patient will be required to have a chest X-ray, ECG, pulmonary function tests and cardiac screening. Screening laboratory investigations should include complete blood count, renal profile and urinalysis. If the patient is found to be anaemic, preparations for autologous blood donation including iron and erythropoietin may be appropriate, as substantial blood loss often occurs perioperatively. Even an asymptomatic urinary tract infection should be treated before proceeding with THR. Psoriasis is also associated with risk factors

for metabolic syndrome. This has been compounded by the chronic use of steroids in this patient therefore screening the lipid profile, glucose, HbA1c and cardiac are paramount. Our patient will have to undergo a stress ECG and echocardiography to assess their cardiac fitness. The patient should be started on lipid lowering drugs depending on the lipid profile levels.

The patient was on prednisolone of unknown doses and duration of time so it's safe to assume our patient has used more than 5mg/d chronically. The patient will have to undergo a moderate stress procedure to screen for suppression of her hypothalamic-pituitary-adrenal axis. Thus stress dose steroids in the form of hydrocortisone 50 mg IV, then postoperatively 20mg IV every 8 hours for 3 doses and then pre-operative dose was resumed on post-operative day 2. Dual VTE prophylaxis is recommended to be initiated, preferably with LMWH at least 12 hours before surgery and extended to 35 days after surgery. This is to be augmented with intermittent pneumatic compression device to be used during the hospital stay. Perioperative antibiotics, such as IV Cefazolin are also recommended. The patient will have to be counselled for weight reduction prior to elective arthroplasty as she is obese.

CONFLICT OF INTEREST

The authors confirm that the content of this article has no conflict of interest.

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