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# Preoperative evaluation of a woman with rheumatoid arthritis

You are asked to evaluate a woman who has taken piroxicam and methotrexate for many years

You are asked to perform a preoperative evaluation for a 54-year-old retired legal secretary whom you follow regularly. While reaching for a flower pot on a shelf in her garage 3 weeks ago, the patient became slightly light-headed, lost her balance, and fell to the concrete floor, striking her head. Since then she has had constant left occipital headaches, mild visual blurring, and weakness of the right upper extremity.

Magnetic resonance imaging (MRI) on the day of the injury showed an extensive subdural hematoma with both clotted blood and fresh bleeding, and flattening of the underlying cerebral cortex. A follow-up MRI study on the day before your examination showed an increase in acute blood accumulation. She was subsequently scheduled for evacuation of the hematoma.

The patient has had rheumatoid arthritis for 15 years, and has received treatment for hypertension for the last 3 years. She has taken piroxicam daily and methotrexate weekly for many years and has received intermittent courses of steroids during exacerbations of rheumatoid arthritis several times, most recently a 4-week course of prednisone 20 mg daily, 3 months ago. She also takes a long-acting calcium channel blocker, which controls her blood pressure well. She has noticed increasing limitation in the range of motion of her neck and has had frequent problems with hoarseness, but denies having any dyspnea.

Physical examination shows limited flex-

ion and extension in the neck, with rotation of the neck restricted to 15° in both directions. She has severe joint deformities in both wrists and knees, ulnar subluxations of several fingers, and a significant degree of synovitis in the metacarpal-phalangeal joints of both hands. The lungs are clear to auscultation, and the cardiac examination is normal. No neurologic deficits are noted.

## PREOPERATIVE TESTING

1 Which test need *not* be performed before surgery in this patient?

- Flexion-extension radiographs of the neck
- Inspection of vocal cords by indirect laryngoscopy
- An adrenocorticotropic hormone (ACTH) stimulation test
- A complete blood count

In performing a preoperative medical evaluation, the internist has two important objectives: to identify existing problems (and do as much as possible to correct them if they could lead to complications during or after surgery), and to assess the risk of specific complications on the basis of recognized risk factors (and attempt to modify them).

Given this patient's long-term use of methotrexate, she needs a complete blood count to check for evidence of bone marrow suppression.



Flexion and extension views of the cervical spine are also needed, since up to 40% of patients with rheumatoid arthritis have some element of atlantoaxial joint disease.<sup>1,2</sup> Ligamentous and bony erosions can lead to subluxation of C-2 on C-1, compressing the spinal cord. This patient has decreased range of motion of the neck, suggesting rheumatoid involvement of the cervical spine. If radiographs of the cervical spine reveal bony erosions, it is important to communicate this finding to the anesthesiologist, who is responsible for establishing and maintaining a patent, safe airway.

In addition, the physician should inspect the vocal cords by indirect laryngoscopy or direct nasopharyngoscopy, because deterioration of the cricoarytenoid membrane is common in rheumatoid arthritis.<sup>3</sup> Hoarseness or stridor are important signs and should be evaluated before intubation, as adduction of the vocal cords commonly results from this condition and can lead to further damage following intubation. The laryngoscopic findings should be communicated to the anesthesiologist as well.

#### ■ CORTICOSTEROIDS NEEDED, BUT NOT ACTH STIMULATION TESTING

Surgery increases the physiologic requirement for cortisol, and long-term corticosteroid therapy suppresses the hypothalamic-pituitary-adrenal (HPA) axis; together, these factors increase the likelihood of adrenal insufficiency. In the postoperative period, patients receiving long-term steroid therapy may develop nonspecific symptoms mistakenly attributed to other conditions. Nausea, vomiting, fever, abdominal pain, and hypotension are signs that should be routinely sought in these patients; if these are present, parenteral steroids should be promptly initiated to avoid the risk of hypovolemic shock.

Generally, the worst postoperative outcomes occur after long-term, uninterrupted, high-dose corticosteroid use.<sup>4,5</sup> However, even after short-term corticosteroid therapy (ie, 3 to 4 weeks), the HPA axis recovers slowly, and

the adrenal gland is the last to respond.<sup>4</sup>

Because this patient has taken corticosteroids for extended periods, both intermittently and relatively recently, she has a high risk of HPA impairment. She should therefore receive hydrocortisone intravenously for the first few days after surgery.

However, she does not need an ACTH stimulation test before surgery. This test may be useful when the degree of HPA suppression is uncertain or concern exists about steroid-related postoperative complications. We already know that this patient is likely to have some degree of HPA suppression and will need corticosteroid therapy after surgery; therefore, the results of an ACTH stimulation test would add little to the preoperative assessment.

The corticosteroid dosage varies, depending on the degree of steroid dependency before surgery and the type of surgical procedure (which may affect the patient's ability to take medications by mouth). Patients usually receive hydrocortisone intravenously at the beginning of surgery, then every 8 hours for the first 24 hours. Thereafter, they usually receive oral doses, rapidly tapered to the patient's usual dose or discontinued over 3 to 7 days.

#### ■ DECREASING OPERATIVE RISK

2 Which would be most useful in avoiding postoperative complications in this patient?

- Stop piroxicam at least 1 week before surgery
- Stop methotrexate 1 week before surgery
- Start acetaminophen 1 week before surgery
- Stop both piroxicam and methotrexate 1 week before surgery

Several medications commonly used in rheumatoid arthritis increase the risk of bleeding. For example, nonsteroidal anti-inflammatory drugs (NSAIDs), a mainstay of arthritis management, can decrease platelet aggregation. This patient takes piroxicam, an NSAID with an average half-life of 50 hours common-

**The worst postoperative outcomes occur after long-term uninterrupted high-dose corticosteroid use**

ly used in rheumatoid arthritis because of its prolonged analgesic effect.

In preoperative patients, NSAID use should be minimized to decrease the risk of operative bleeding. Ideally, NSAIDs should be discontinued 4 to 5 serum half-lives before surgery to avoid these potential complications.

Acetaminophen, which has no effect on platelet function, is usually substituted for NSAIDs 7 to 10 days before surgery.

NSAIDs (and aspirin) can also suppress prostaglandin synthesis and impair renal perfusion. Patients taking these agents should therefore be monitored for renal impairment.

In theory, methotrexate may delay wound healing and increase the risk of perioperative infection, although reports are conflicting and this point is controversial. One should consider withholding methotrexate if significant operative blood loss is anticipated,<sup>6</sup> because blood-volume loss can significantly prolong the elimination of this drug, resulting in greater bone marrow suppression.

In view of the known effects of NSAIDs and the controversy over methotrexate use, the best management plan for this patient is to withhold both methotrexate and piroxicam before surgery. Use of acetaminophen, by itself, does not decrease the risk of postoperative complications.

### ■ IS A CHEST RADIOGRAPH NEEDED?

3 Should a chest radiograph be obtained as part of this patient's preoperative assessment?

- Yes
- No

The same indications for chest radiographs and pulmonary function tests apply in patients with rheumatic disease as in other patients, and unless specific clinical indications exist, chest radiographs need not be routinely obtained. This point deserves emphasis, since medical tests are frequently performed for non-

medical reasons (eg, lack of awareness about costs and benefits, concern about litigation).

In the absence of clinical symptoms, the pretest likelihood that a chest radiograph will reveal a meaningful abnormality is small, because relatively few patients about to undergo elective surgery have such abnormalities. Further, any abnormality that the chest radiograph may uncover will usually contribute little to operative risk.

If, on the other hand, the patient has dyspnea, then chest radiographs and pulmonary function tests would help exclude conditions such as rheumatoid lung disease or pleural effusion, both of which might affect the anesthetic and postoperative management. Rheumatoid lung disease, for example, is associated with pulmonary fibrosis and restrictive lung disease, which may decrease the ease of intraoperative ventilation or increase the work of breathing in the postoperative period. On the other hand, hydrophilic anesthetic agents can accumulate in large pleural effusions, thus delaying recovery from anesthesia.

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**The likelihood that a chest radiograph will reveal a meaningful abnormality is small, absent symptoms**