Spine University’s Guide to Spine Surgery and MRSA

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Introduction

You may have heard about superbugs (infections that are very hard to treat with antibiotics). These types of bacteria are often picked up while someone is in the hospital. Although they normally don't do any harm these bacteria do cause problems when someone is ill or who has had surgery is infected. For this reason, it's important for surgeons and other healthcare professionals to identify patients who are at risk and to increase their vigilance in protecting patients from becoming infected.

Who is at risk for infections from surgery?

While anyone can develop an infection, some people are at a higher risk of developing one. Those at higher risk are people who

- are already ill
- are over 60 years old
- have diabetes
- smoke
- have poor dietary habits
- have had infections from surgery before
- use steroids or have been prescribed steroid treatment
- abuse alcohol
- already have an infection at the time of surgery

Even if you don't have a higher risk, there are many things that occur in a hospital that can cause an infection. This includes if you have to have anything that is invasive, or put into your body, such as

- a needle to withdraw fluid or tissue
- an intravenous to give fluids, blood, or medication
- a urinary catheter to empty urine from your bladder
- a surgical incision

In a study done in the mid-1990s on the infection risks of spinal surgery in particular, Margareta Olsen and colleagues found that there were risks from the surgery itself. She listed these as

- lengthy surgeries
- complicated surgeries
- how the instruments were placed
- if the fusion of bones extended past the sacrum (large bone at the base of the spine)
- if there is a hematoma (a mass of clotted blood)
- if there has been a lot of blood lost during surgery

Does spinal surgery have a higher risk of infections?

People who have had spinal, or back, surgery can develop infections just as with any other type of surgery. The problem isn't the number of infections but the type of infections and what can happen because the infections are in the back, where the spinal cord is. An infection in the spinal cord area can have devastating consequences if it's not treated quickly.

According to a study done by A. Fang and colleagues, the majority of infections in spinal surgery were due a bacteria called Staphylococcus aureus (S. aureus). The danger of this type of infection is that this type of bacteria has evolved into one of the superbugs and if the superbug, called MRSA, is the cause of the infection, it can be very difficult to treat.

Staphylococcus aureus is a common bacteria that many of us already have on our skin or in our nasal passages. Doctors and researchers estimate that about 25 to 30 percent of us are walking around with the bacteria. It can also be found under your arm, around a chronic wound, in the perineal area (vagina, penis), and even in our sputum, or phlegm. Most of the time, the bacteria doesn't do anything, but if it does cause an infection, it's usually treated
with an antibiotic from the *beta-lactam* family of antibiotics, one of which is methicillin. The most commonly used antibiotics in the family are penicillin and amoxicillin.

**MRSA** (*methicillin-resistant staphylococcus aureus*) is staphylococcus aureus that has become resistant to methicillin. In other words, methicillin can't kill off the bacteria as it should. Researchers don't really know how many people are affected with MRSA, but the *Centers for Disease Prevention and Control* (CDC) reports that about 1 percent of the general public are infected with the superbug. Estimates of people who are in the hospital on wards that take care of orthopedic (bone) surgery or general surgery range about 5.3 percent.

**What can happen because of a spinal surgery infection?**

Infections after spinal surgery may not always show up right away. Sometimes, it can take several weeks for the signs to appear. There are reports of some infections showing up a few years after surgery.

Your spine is a complicated body part that plays a vital role. There are the bones that make up your spine, which are called *vertebrae* and the spinal canal through which fluid flows up and down to the brain, called *cerebral spinal fluid* (CSF). There are also the nerves that travel down your spine and branch off at the different vertebrae, and various muscles and body tissues that surround the spine and support your body.

If an infection develops as the result of spinal surgery, it could be in any of the part of the spine. If an infection develops in the cerebral spinal fluid (CSF), this fluid travels up and down the spinal canal and into the brain. If the infection develops in the bone, this can result in *osteomyelitis*, a very difficult to treat infection. Infections can cause swelling and blockages along the spine, putting pressure on nerves. This can cause pain or even paralysis, depending on where the blockage and the pressure are.

Spinal infections can require long periods of treatment with antibiotics. In some cases, spinal infections need surgery. Surgery may be done to wash out the infected area and/or to remove damaged tissue. If there is hardware (screws, plates, or rods), it may need to be removed and replaced too. Sometimes the surgeon needs to operate in order to relieve pressure on the spine that is caused by the infection.

After the wound is closed, usually antibiotics are prescribed to continue fighting the infection. Sometimes, the wound can't be closed after the surgery. In that case, the doctor would pack a dressing inside. This dressing must be changed a few times a day until the wound can be closed.

All this extra care requires extra time and resources, and causes extra pain and distress for the patients. If the infection is caused by MRSA, rather than just *S. aureus*, the patients need to be isolated from other patients. There are very few antibiotics that can treat MRSA. There are still a couple of antibiotics, such as vancomycin, that can fight MRSA. They are expensive and very strong, with side effects that can cause even more problems.

**What causes MRSA?**

Although many people have the impression that MRSA is a new problem, it's actually been around since the early 1960s. The first big outbreak of MRSA in the United States was a few years later. Antibiotic resistance was noticed even earlier with penicillin.

Antibiotic resistance is caused by incorrect use or unnecessary use of antibiotics. Antibiotics are not intended for viruses, such as colds and the flu. Antibiotics only treat bacteria. For viruses you need an antiviral medication if one
has been developed. Yet, many people insist on antibiotics for these very illnesses. If the doctor gives in and prescribes them or if the people obtain antibiotics from friends or relatives, this overuse of antibiotics contributes to the growth of antibiotic resistance. This is also why people are encouraged to complete their antibiotic prescriptions even if they feel better, there may still be bacteria present and by not completing all the antibiotics, the bacteria can become resistant to the medication.

**How is MRSA spread?**

MRSA is spread by person-to-person contact. This can happen between anyone, but often it happens through healthcare workers going from patient to patient or visitors visiting in one room and moving to another. Other people become infected outside of the hospital environment with what is called community-acquired MRSA, which means they have gotten it somewhere outside of the hospital.

Another researcher, T.E. West, and colleagues, found that by keeping patients who had MRSA away from those who didn't have it, they reduced the infection rate in the hospital to 0.49 cases out of every 1000 patient days. In 1999, the CDC, which oversees prevention of spread of infection, said that surgeons should test their patients preoperatively (before surgery) to check for MRSA. This was to avoid the patient or the caregivers from transferring the bacteria from the nose to the surgical wound.

The incidence of MRSA is rising quickly and continues to rise, providing a difficult challenge for the medical community. The CDC has found that MRSA infections rose from 2 percent in 1975 to 57.1 percent in 2007.

**When does MRSA become a problem?**

For people who are healthy, MRSA isn't a problem. They can live their life without worrying about getting sick. But, when there is an illness, a weakness in the immune system, which normally keeps you from getting sick, or there is a break in your skin, like a cut, the bacteria can enter and cause an infection.

Surgeons are particularly concerned with MRSA infecting their patients. For example, with spinal surgeons, if the majority of infections are caused by S. aureus, then the chances of the patients getting MRSA are high.

If patients are found to have MRSA before surgery, they can be isolated away from patients who don't have it, to prevent spreading the bacteria. Then, while in isolation, the patients who are infected can receive antibiotic treatment, like vancomycin, to get rid of the infection. The concern among the medical community is if they use these antibiotics too often, the bacteria may change yet again and become resistant to what few antibiotics are left.

**Can people be screened for MRSA?**

General screening for MRSA isn't done because of the cost and the wide scope of people who may be infected with it. It would also put a big burden on the healthcare system because they'd be testing healthy people who aren't bothered by the bacteria. It's when people become ill or need surgery that it only becomes an issue. That being said, there's a push for people who work with at-risk patients to be routinely screened for MRSA. Studies have shown that healthy people can be easily treated with nasal ointments and special soaps, such as chlorhexidine soaps. If the caregivers are treated for MRSA, the patients are at a lower risk of becoming infected.

If you are admitted to a hospital for surgery, your surgeon may decide to screen you for
MRSA if you have one of the following risk factors

- being in the hospital sometime over the past two years
- being in a nursing home sometime over the past year
- taking antibiotics over the past year
- severe illness
- a history of intravenous drug use
- a history of surgery
- being in close contact with someone who is at high risk as described above

**What are the effects of MRSA infection?**

Infection with MRSA after surgery can cause a domino effect of problems for the patients. Infection means more pain and discomfort. More pain and discomfort means more medications. If the infection becomes severe, more surgery may be needed. Because of the MRSA infection, the patient needs to be isolated, which adds to the cost of medical care. The antibiotics that treat MRSA are very expensive and there is, of course, the lengthened hospital stay and possibly lengthened rehabilitation or recuperation with help at home or in a rehabilitation facility.

The effects of an MRSA infection aren't only physical. A study done in 1997, by Paul Kennedy and Lucy R. Hamilton, looked at the psychological impact of MRSA infection in patients who had had spinal cord injuries. They found that the patients who were infected compared with patients with the same types of injuries who weren't infected, experienced more anger and hostility over their situation. They felt that their rehabilitation was badly affected by the imposed isolation because of the infection. However, a few patients did find that the isolation helped them gain privacy to deal with their injuries.

**How can we protect ourselves if we are having spinal surgery?**

If your surgeon has recommended that you have surgery for your back problems and you feel that MRSA may be a worry for you, there are a few things you can do to help yourself. Be sure to tell your doctor if you have had any recent infections, reduce your risk by not smoking, eating well, and not abusing alcohol, and be sure that anyone you come in contact with in the hospital, including your visitors, wash their hands well or use antimicrobial wash before coming into your room.

After you have gone home, watch for signs of infection. These include

- reddening and/or swelling around the incision
- increased pain at the incision area
- fever, chills
- pain in the back that wasn't there before
- changes in sensation (numbness, pins and needles) below where you had your surgery
- incontinence of your bowel or bladder (not controlling urine or stool)

If you have any of these signs or symptoms, contact your doctor as soon as possible.