Hughston Health Alert

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Rotator Cuff Lesions

The rotator cuff comprises a group of four muscle-tendon units that wrap around the front, top, and back of the shoulder joint. The muscles, which are connected to bones by tendons, move the shoulder in many directions and hold the humeral head (ball) and the glenoid (socket) together. A bursa, which lies over the tendons, reduces friction between the tendons and bone and protects the tendons from excessive pressure (Figs. 1 and 2).

If you overuse or injure your rotator cuff, you can develop lesions (changes in the tissue). There are many degrees of rotator cuff lesions. You may have a minor lesion, such as inflammation or tendinitis (inflammation of the tendons), or you may have a more severe injury, such as a partial tear of the muscle and tendon fibers or a complete tear of the tendon that causes the muscle to pull away from the bone (Figs. 3 and 4, pg. 2).

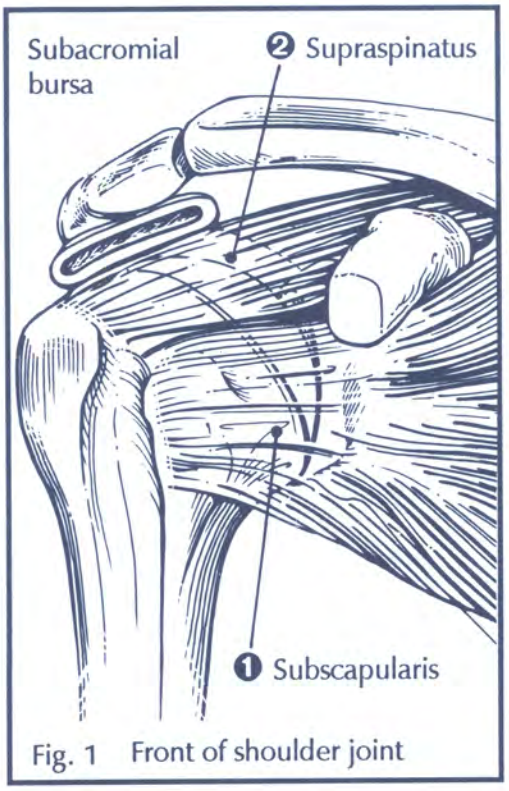

Fig. 1 Front of shoulder joint

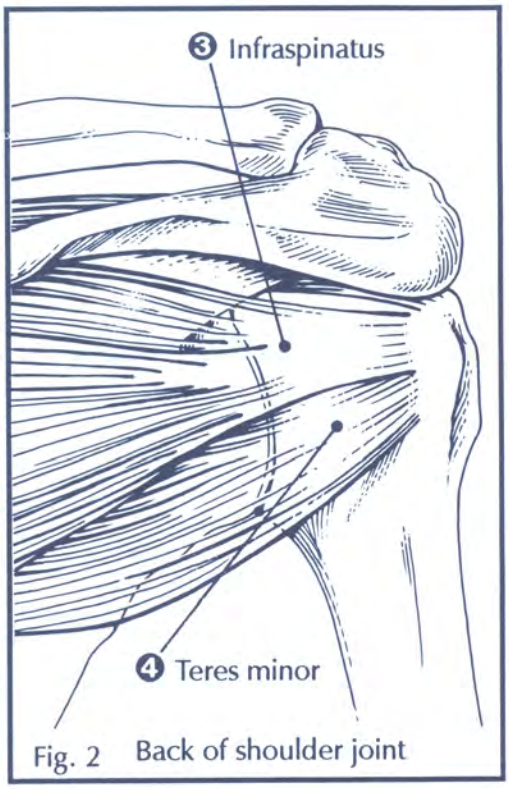

Fig. 2 Back of shoulder joint

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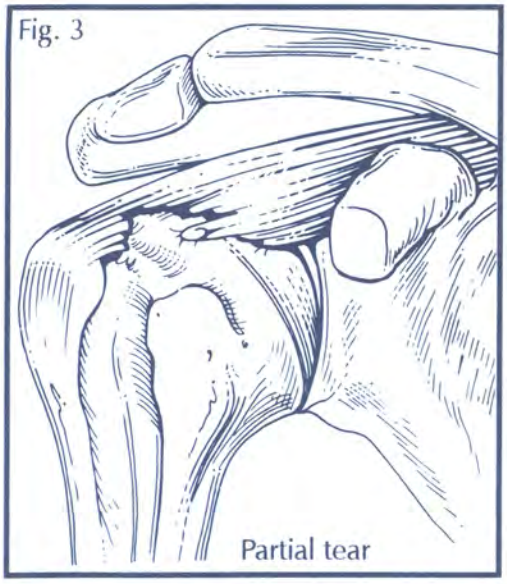
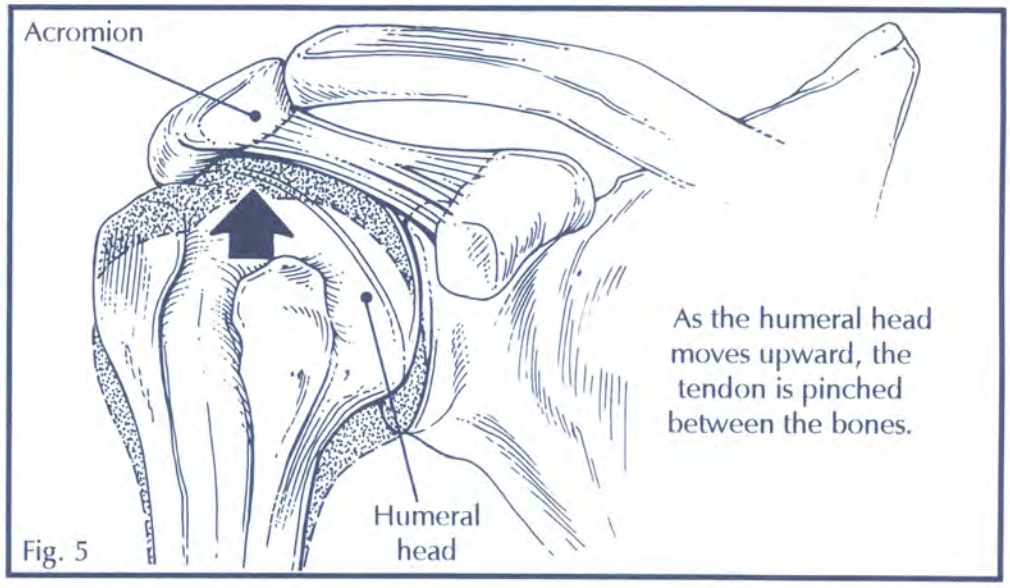
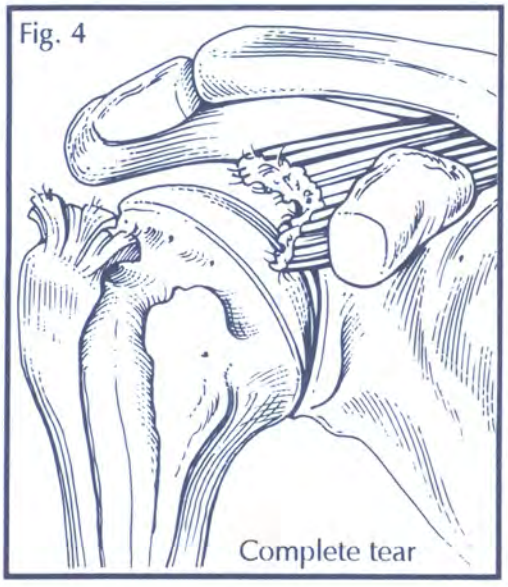
Symptoms

Symptoms associated with a rotator cuff tear are often mild at first and worsen over time. Common symptoms include pain at night and pain that worsens with activities, particularly when using your arm over your head (e.g., lifting a box off a shelf). These symptoms are similar to those of tendinitis or bursitis (inflammation of the bursa). However, unlike bursitis or tendinitis, which gets better when you rest, modify your activities, and take anti-inflammatory medications (such as aspirin or ibuprofen), the symptoms of rotator cuff tears may not get better with the usual treatment.

In addition to pain, your arm and shoulder may feel weak when you use your arm over your head or when you raise your arm out to the side of your body. Occasionally, a trivial activity,







such as lifting a suitcase from the trunk of a car, may cause acute pain in the shoulder. This pain may indicate that your partially torn rotator cuff is now completely torn or your degenerative rotator cuff tendon is torn.

Causes

There are many things that can cause the rotator cuff to tear. Constant stress and wear from doing the same activity over and over can cause the tendons to fray from the bone. The rotator cuff tendons often tear in people who are about 40 years of age or older because their tendons have been worn down slowly over time from the stresses of everyday work and activities, especially when the work or activities were done with their arms over their head. The rotator cuff tendons of a person with an abnormally loose or unstable shoulder can get sandwiched between the humeral head and acromion (roof of bone above the tendons) and eventually can tear (Fig. 5). And sometimes, natural variations in the way the shoulder joint is built causes abnormal wear on the tendons that can cause a tear.

Treatment

The first treatment your doctor will ask you to try to relieve the inflammation and irritation of the rotator cuff tendons and the bursa over the tendons is resting and icing your shoulder and taking anti-inflammatory medications. Occasionally, the doctor may inject cortisone (a strong anti-inflammatory medication) in the bursa to decrease inflammation and pain. When the inflammation is under control or has decreased significantly, you can do exercises that strengthen the muscles around the shoulder joint.

If you have had tendinitis of the rotator cuff for a long time, you may develop irreversible changes that lead to partial or complete tearing of the rotator cuff tendons. If your rotator cuff is inflamed and partially torn, your doctor may remove bone spurs (ligament that has turned to bone where it attached to the bone) and inflamed tissue to create a more suitable environment for the tear to heal. Some people who have partial rotator cuff tears have little discomfort and function very well without surgery. Exercises and an occasional injection of cortisone may help them control symptoms so they do not have to have surgery.

If the rotator cuff has completely torn and the muscle has pulled away from the bone, the doctor will usually operate on your shoulder to repair the tendons and remove bony prominences. The operation helps relieve the pain you have at night, during rest, and from daily activities.

To repair the torn rotator cuff, the doctor makes an incision in your shoulder. After removing the overlying bursa and any degenerative, frayed, or fragmented pieces from the edges of the torn tendon, the doctor decides how to repair the rotator cuff tendon. If the tear is small, the ends of the tendon may be sewn together.

However, if the tear is large, the doctor will attach the tendon to the bone on the other side. First, the doctor creates a small trough in the humeral head and drills several small holes in the bone. Next, three or four sutures (stitches) are placed through the tendon and tied (Fig. 6).

After surgery, your shoulder will be immobilized to help the rotator cuff heal. Before the brace is removed, you will begin an exercise program to regain full range of motion in the shoulder and to strengthen shoulder muscles.

Rotator cuff lesions can cause mild to severe shoulder pain and can cause you to limit your activities. Nonoperative treatment, such as strengthening exercises, having injections of cortisone, taking anti-inflammatory medications, and modifying your activities, may promote healing of a partial rotator cuff tear and help decrease the inflammation that causes pain. But you will probably need to have an operation if you have a complete tear.

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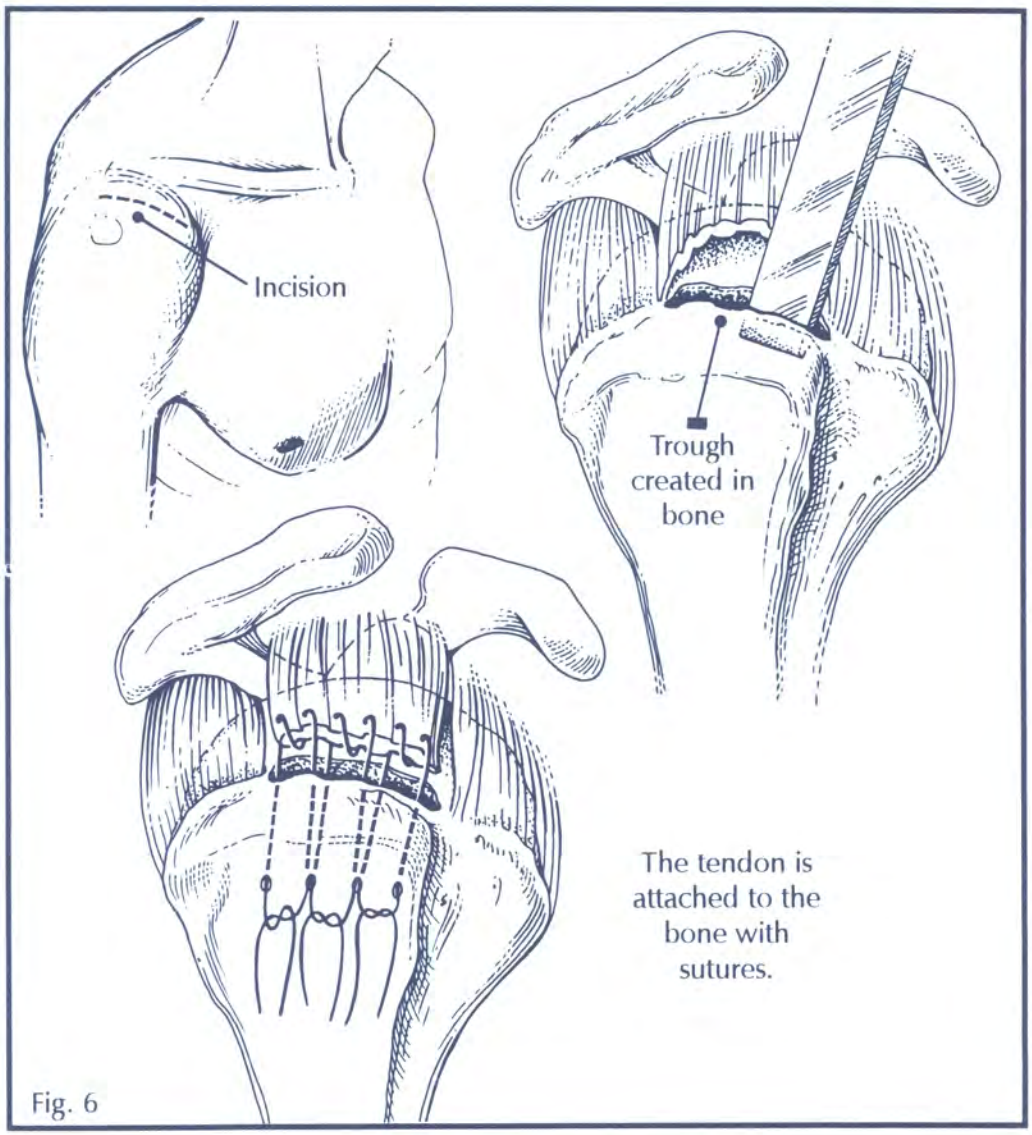

Fig. 6

Blood-Borne Infections in Athletes

Arthur Ashe, Magic Johnson, Greg Louganis. Each of these well-known, highly skilled athletes has stepped before the public's eye to report that they are infected with HIV (human immunodeficiency virus), which is the organism that causes AIDS (acquired immunodeficiency syndrome). Each athlete probably acquired the virus through a different route. Therefore, their announcements that they are infected with HIV (and the death of Arthur Ashe on February 6, 1993, due to complications related to AIDS) have illustrated that blood-borne infections, such as HIV, are not confined to a limited population. In fact, these infections can potentially affect any of us. These athletes have raised awareness among athletes at all levels regarding the potential risks for contracting this and other potentially deadly blood-borne infections.

How are blood-borne infections transmitted?

The blood-borne infections that are transmitted from one person to another most commonly include HIV and Hepatitis B. These viruses are transmitted through sexual contact, including vaginal, oral, and anal sex; from mother to infant during pregnancy, birth, or breast feeding; and through direct exposure of infected blood to mucous membranes or uninfected blood, such as with intravenous drug use (including anabolic steroid use). Medical experts believe that athletes infected with the HIV virus are competing at all levels of athletics, including high school, college, and professional levels.

Can I be infected during competition?

The risk of transmitting HIV from one athlete to another during competition is extremely low because of established safety precautions and because the criteria for transmission are rarely met. To transmit HIV during

competition, an infected athlete must have a bleeding wound that comes in contact with the bleeding wound or mucous membrane of an uninfected athlete. To date, there have been no proven cases of HIV transmission during athletic competition. There was one anecdotal report of a soccer player in Italy, but this has never been verified.

The risk of transmitting Hepatitis B from one athlete to another during competition is slightly higher because concentrations of Hepatitis B in the blood are higher than HIV. However, only one case of Hepatitis B transmission during athletic competition has been reported.

Prevention

Nevertheless, there is a theoretical risk of contracting HIV and Hepatitis B from exposure to contaminated blood during sporting events. This risk has scared many athletes and athletic governing bodies. To combat the fears and to decrease the risk of infection transmission, athletic and government agencies have established many programs designed to prevent the extremely unlikely, but theoretically possible, transmission of blood-borne infections during athletic competition. Health care personnel who treat athletes with sports injuries involving blood and bodily fluids have been urged to follow the universal precaution guidelines established by the Centers for Disease Control and Prevention in Atlanta, Georgia. The guidelines require a bleeding athlete to be removed from play until the bleeding is controlled and the wound is covered and require bloody uniforms and surfaces to be cleaned with a bleach and water solution. The guidelines also include educational information for athletes about the low risk of transmission of blood-borne infections during sports participation. Athletes are taught that the greatest risk of transmission of these infections occurs outside of sports, such as during sexual contact or intravenous drug use, including sharing needles when using anabolic steroids.

A more controversial precautionary method includes mandatory testing for HIV infection. The legal system has laid down several very specific guidelines that suggest which athletes should be tested, when athletes should be tested, and what factors infringe on an athlete's right to privacy. Because of the extremely low risk of transmission during athletic activity, the general thought is that mandatory HIV testing of athletes is not only unnecessary, but probably illegal. Possible exceptions in the future may be made in athletic events in which bleeding is common, such as boxing, tae kwon do, and wrestling.

. . . the greatest risk of transmission of these infections occurs *outside* of sports . . .

Currently, voluntary testing and counseling are the primary method of identifying athletes infected with HIV without infringing on the athletes' privacy.

In summary, the risk of transmission of blood-borne infections during athletic competition is extraordinarily low, particularly transmission of HIV. Common sense guidelines, such as the universal precautions for treating a bleeding athlete, are used to further basic safety precautions. The best prevention remains educating athletes about the causes and risks for transmission of blood-borne infections and the common sense precautions that can be used to prevent these infections.

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Sacroiliac Joint Dysfunction in Athletes

Like the general population, athletes often have low back pain. This common problem can be treated effectively if the cause is known. One frequent cause of low back pain is sacroiliac (SI) joint dysfunction. Sacroiliac joint dysfunction can coexist with other common spine problems, which can limit an athlete's ability to participate in sporting activities.

What is the sacroiliac joint?

The sacroiliac joint is an irregularly shaped joint that connects the ilium (pelvis) to the sacrum (tailbone) (Fig. 1). This joint can cushion and reduce stress to the pelvic area by buffering shock to the pelvis. Forces from

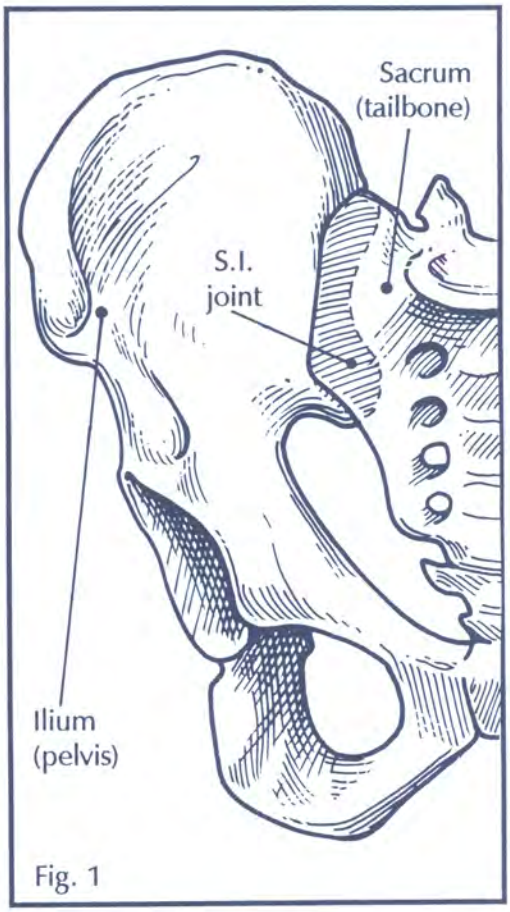

Fig. 1

walking and running are transmitted from the femur (upper leg bone) to the ilium to the lower back or are transmitted from the lower back to the ilium to the femur. The SI joint absorbs many of these forces as they are transmitted from one part of the body to another, thereby reducing stress and preventing injuries to the pelvis.

The area around the SI joint can be injured traumatically (sudden forceful injury as in falling, twisting, or misstepping during sports participation) or by overuse (e.g., overtraining). At times there is no known injury. An unknown injury to the SI joint is usually considered an overuse injury. Because there are many ways that an SI joint injury can occur, knowing the way the injury happened does not necessarily help in the assessment of the SI joint, which involves specific tests of the joint.

Symptoms

Common symptoms of SI joint dysfunction include pain, stiffness in your lower back in the morning, difficulty standing up straight (especially after sitting for a long time), and increased pain and stiffness when you are sitting or standing.

The intensity of pain can vary from day to day and from person to person, and it can range from dull to intolerable. This pain is usually located in the lower back, buttocks, or SI joint area. The symptoms also commonly affect your legs or groin area and may mimic a ruptured disc or pinched nerve by causing radiating pain and weakness in your legs. Often, with elite athletes, the predominant symptom may be a feeling of stiffness, not pain.

Treatment

If you have an acute (recent) low back injury, your team doctor, family doctor, or orthopaedist will examine you to make sure you do not have a severe injury that may need to be treated with an operation. If you do not have a severe injury, your doctor may refer you to a physical therapist with specific skills in manual therapy, such as mobilization. The physical therapist will evaluate your SI joint and lumbar spine (lower backbone).

Fig. 2

If you have an SI joint dysfunction, or stiff SI joint, the physical therapist will gently mobilize the SI joint area with his or her hands and will prescribe specific exercises that you can do at home to treat the affected area (Fig. 2). Applying heat or ice to the area may help loosen tightened muscles but is usually not necessary. Your doctor may suggest that you use anti-inflammatory medications along with the exercises the physical therapist prescribed to help relieve inflammation, stiffness, and pain.

After your first treatment, you should be able to move about more easily. But, you will still have pain in your lower back. You should gradually improve over 10 to 14 days if you continue doing your exercises. As you progress in your treatment, you will be able to do more activities until you are fully recuperated and ready to resume participating in sporting activities.

Sacroiliac joint dysfunction can be a painful, debilitating problem for athletes, as well as other people. But, with the proper treatment, you can return to sports participation without pain.

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The Good and Bad Aspects of Performance Supplements

Athletes frequently take performance supplements to increase muscle mass and to improve physical performance or appearance. But, these supplements, which range from multivitamins to anabolic steroids, cannot replace a diet high in carbohydrates, moderate in protein, and low in fat.

Multivitamins

Multivitamin and mineral products are among the most popular supplements marketed for athletes. People who do not eat regular, well-balanced meals may substantially

improve their nutrient intake by taking a multivitamin and mineral supplement that contains 100% of the Recommended Dietary Allowances (RDA) of each nutrient. The RDA is the amount of a vitamin or mineral a person needs and can safely consume each day. On the other hand, consuming vitamins and minerals far in excess of the RDA may harm you and may change the way your body uses the nutrients you eat (see "Nutrition and Bone Health," Vol. 6, No. 4).

There is no scientific evidence that megadoses of vitamins and minerals specifically enhance athletic performance. There is evidence, however, that some supplementation with antioxidant vitamins, such as vitamin C, vitamin E, and beta carotene, may help prevent cardiovascular disease and various types of cancers. These supplements may also protect against muscle tissue damage possibly caused by increased production of free radicals after intense exercise. But, some researchers believe there is not enough evidence that antioxidant supplementation prevents disease.

. . . no supplement can replace the benefits of a nutritionally balanced diet.

Anabolic steroids

Anabolic steroids are synthetic derivatives of the male hormone testosterone, which both women and men produce in their bodies. Anabolic steroids are not appropriate for the treatment of simple medical problems but may be used to treat breast cancer, severe anemia, and osteoporosis.

Some athletes take anabolic steroids to build up muscle size and strength, to enhance physical appearance, and to help them perform better. But, the indiscriminate use of anabolic steroids by athletes without the supervision of a physician may lead to dangerous, irreversible side effects, such as decreased testicle size, severe acne, breast development in men, excess body and facial hair in women, high blood pressure, high blood cholesterol, and liver disease. Professional football player Lyle Alzado blamed long-term anabolic steroid use for his development of brain cancer, which ultimately killed him.

Psychological side effects of anabolic steriod use include depression, aggressive behavior, and mood swings. The International Olympic Committee has banned the use of anabolic steroids because of their dangerous side effects and because they give the user an unfair advantage.

Amino acids: Not a steroid alternative

Amino acids are protein building blocks that are often marketed as legal alternatives to anabolic steroids. They are touted as growth hormone stimulators that enhance performance. Growth hormone is a powerful anabolic hormone that influences bone and muscle growth. Excess release of growth hormone can increase muscle size, but it can cause the muscles to become weaker. Therefore, it does not help you perform better.

Although all amino acids affect growth hormone release to some extent, only arginine and ornithine have a significant effect on growth hormone release. Most available supplements provide only small quantities of arginine and ornithine. Also, if taken in single, large doses, amino acid supplements may cause amino acid imbalances and may be toxic. For most individuals, amino acid supplements are just expensive and unneeded protein supplements.

In summary, the most important point to remember is no supplement can replace the benefits of a nutritionally balanced diet.

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Total Joint Replacement

One Patient's Experience

Total hip and total knee replacements are some of the most successful orthopaedic operations in the world today. The surgery is performed for people with severe arthritis of these joints when nonoperative treatments fail to give adequate relief of pain and fail to

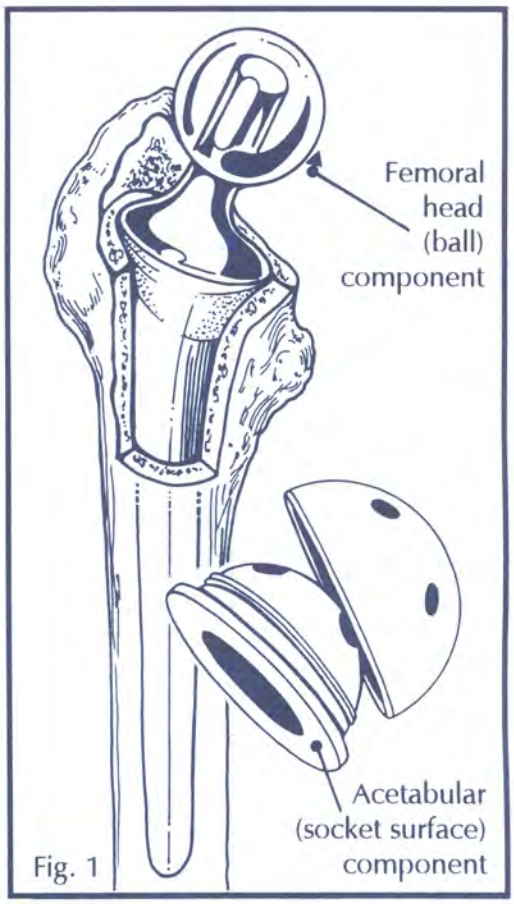

Fig. 1

restore joint motion and function. Pain is the main symptom that brings arthritis sufferers to consider having this surgery. Fortunately, pain relief is complete or nearly so in most uncomplicated joint replacements, and the surgery usually allows the person to return to near normal function, including non-impact sports participation. Total joint replacement is routinely a gratifying experience for both the patient and the surgeon.

What's it like to have a total joint replacement?

Virginia Ellis has had two joints replaced. Before her first hip operation 45 years ago, she says, "I could hardly walk without a cane." Ellis explains that she was in constant pain because of osteoarthritis, or degenerative arthritis, in her left hip possibly due to a temporary paralysis of her left side when she was 19 years old.

In the 1940s, replacing joints with man-made material was still in the experimental stage. For relief of severe joint pain, most people had an arthrodesis, or joint fusion. But Virginia Ellis wanted motion in her hip joint. She was referred to Austin T. Moore, M.D., in Columbia, South Carolina, who was one of the first doctors in the United States to experiment with joint arthroplasty. Arthroplasty is the surgical reconstruction of a joint to restore motion, ranging from resurfacing to totally replacing the joint. Dr. Moore was the doctor who later replaced the hip of radio and television personality Arthur Godfrey.

In Virginia Ellis' hip joint, Dr. Moore removed the arthritic surface of the femoral head (ball) then placed a cup made of Vitallium (a metallic material) over the femoral head. This arthroplasty enabled her hip to function for 40 years.

Over time, osteoarthritis destroyed Ellis' left knee joint, and the 40-year-old Vitallium cup in her hip wore out. When the pain became too great and getting around became increasingly difficult, Ellis decided she needed to get some relief. In 1990, she had a total hip replacement. Her acetabulum (socket) surface and femoral head (ball) were removed and replaced with metallic and plastic parts constructed to mimick the anatomic parts (Fig. 1).

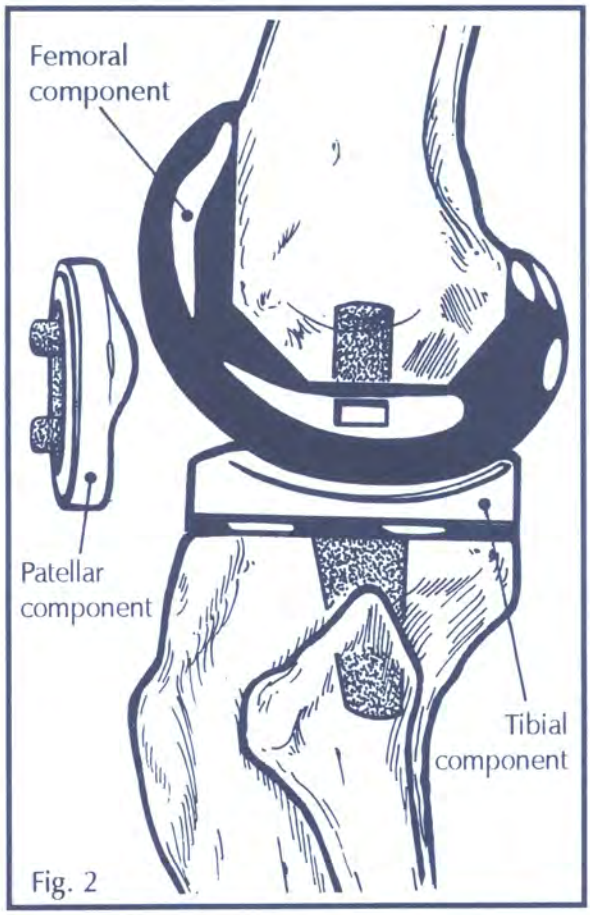

Fig. 2

In August 1994, she had her degenerated knee replaced. The ends of her femur (upper leg bone) and tibia (shin bone) and the underside of her patella (kneecap) were replaced with metallic and plastic parts shaped like the bony pieces removed (Fig. 2).

Virginia Ellis recovered from each operation within 6 weeks. After both operations, she stayed in the hospital for about 2 weeks, during which time she began muscle strengthening exercises. Her pain was gone almost immediately after surgery. She spent the next 2 weeks in a nursing home, where she learned to walk with a cane. When she left the nursing home after the total hip replacement, Ellis had almost completely recovered.

The recovery time for her total knee replacement was a little longer. During the fifth week after her knee surgery, she began stepping into the shower and climbing steps in her home. And, she could drive her car six weeks after surgery.

Less than 1 year after her total knee replacement, Virginia Ellis is beginning to walk without a cane. She still uses a cane when she walks quickly, walks long distances, or walks on unfamiliar ground. She can now do housework in moderation, and she can do necessary activities, such as grocery shopping.

Ellis contributes her quick recovery to her hard work during physical therapy and to her continuing efforts at muscle strengthening and conditioning. She says she "worked hard and did more than what was required." Ellis explains that physical therapy is painful, but you must endure the pain to eventually be able to do normal activities without pain. Now, she regularly swims and attends classes for muscle stretching and occasionally shops.

Why have a total joint replacement?

Virginia Ellis says that when you reach the point that the pain is so bad you can hardly get around and exercises no longer relieve pain, you need relief. After the total joint replacement "you will wonder why you didn't have it done a long time before. It was a tremendous help. It got me on my feet again."

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Ask the Doctor

Q What causes the hip joint to pop when it moves in certain directions?

A The three anatomic structures around the hip that sometimes pop are the iliotibial tract, the psoas tendon, and the labrum. The iliotibial tract, which runs along the side of the hip from the pelvis to the knee, pops most often. As you flex and extend your hip, it occasionally snaps over the side of the hip bone. This snapping may lead to a type of bursitis (inflammation of the bursa), which is typically treated with exercise therapy or local medication. Sometimes the psoas tendon, which runs from inside your pelvis to the hip to the top of the femur (upper leg bone), pops deep in the groin area. This popping occasionally causes tendinitis (inflammation of the tendon), which usually gets better when you take ibuprofen and participate in exercise therapy for a short time. The labrum, which is a fibrocartilage structure adjacent to the socket of the hip joint, is rarely loose enough to cause a pop as the ball of the hip moves in an extreme position in the socket.

Fortunately, hip popping rarely has any serious consequences. And, if it is associated with pain, it can be treated easily.

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The Hughston Health Alert is a quarterly publication of the Hughston Sports Medicine Foundation, Inc. The Foundation's mission is to help people of all ages attain the highest possible standards of musculoskeletal health, fitness, and athletic prowess. Information in the Hughston Health Alert reflects the experience and training of physicians at The Hughston Clinic, P.C., of physical therapists and trainers at Rehabilitation Services of Columbus, Inc., of physicians who trained as residents and fellows under the auspices of the Hughston Sports Medicine Foundation, Inc., and of research scientists and other professional staff at the Foundation. The information in the Hughston Health Alert is intended to supplement the advice of your personal physician and should not be relied on for the treatment of an individual's specific medical problems.

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Health Hints

- Workout equipment in gyms and health clubs is a breeding ground for bacteria and viruses that cause infections, such as the common cold. Avoid these infections by wiping off the equipment before and after you use it and washing your hands after your workout.

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