

# Boutonniere Deformity

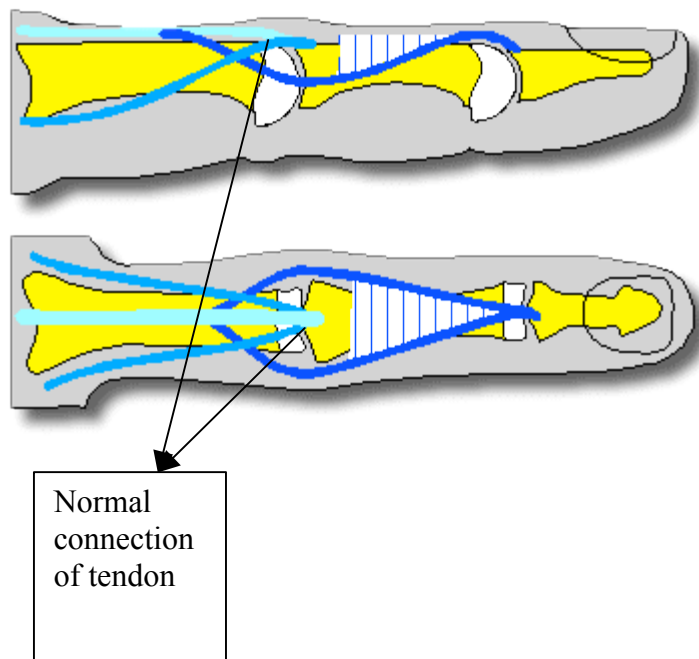
Patient information on the condition

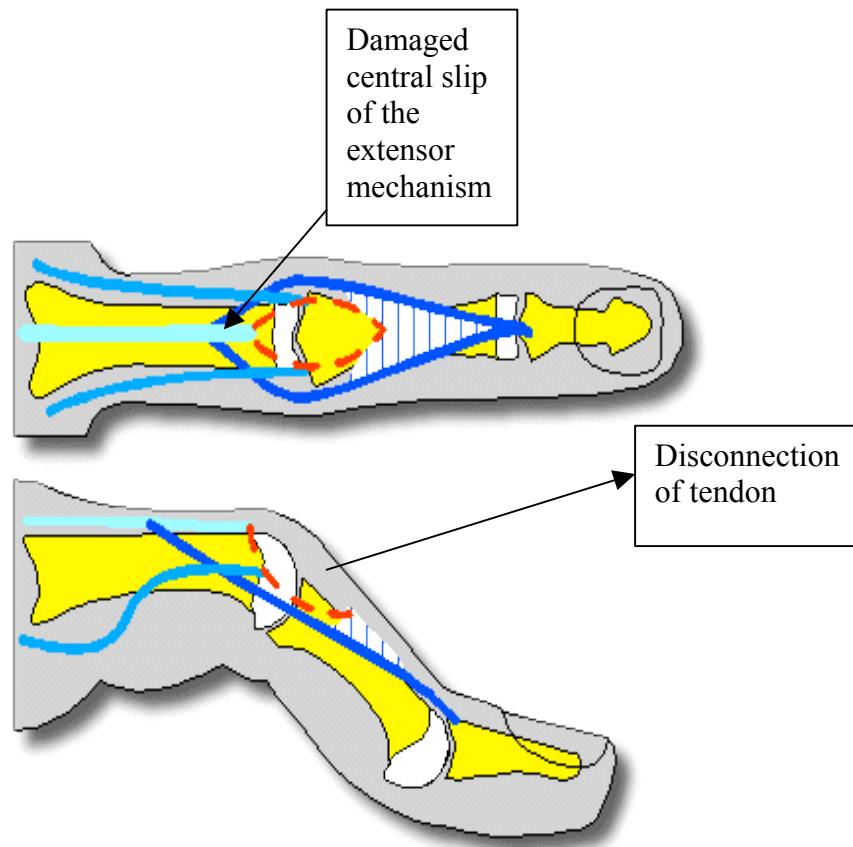
The tendons that allow each finger to straighten, the extensor tendons, become a complex and balanced mechanism that allows very fine control of the movement of each joint of the finger. When this mechanism is damaged in certain areas, this balance can be destroyed and the result is a finger that doesn't work properly. Over time, the imbalance can lead to contractures and other changes that result in a permanently crooked finger. The boutonniere deformity is one problem that affects the extensor tendons of the finger.



## Anatomy

What parts of the finger are involved?





The extensor tendons come from muscles in the forearm. As they travel into the fingers, the extensor tendons become what are called the extensor hood. It flattens out to cover the top of the finger and sends out branches that connect to the middle phalanx and the distal phalanx. When the extensor muscle contracts it shortens and pulls on these attachments to straighten the finger.

Small ligaments also connect the extensor hood with other tendons (flexor tendons) that travel into the finger to bend the finger. These connections help balance the movement of the finger so that all the bones of the finger work together giving a smooth bending and straightening action.



**Distal interphalangeal joint (DIP)**

**Proximal interphalangeal joint (PIP)**

## How do these injuries of the PIP joint occur?

The boutonniere deformity occurs when the extensor tendon attachment to the middle phalanx is injured. This area is called the central slip. This tendon attachment may be injured in many ways. The central slip may simply be damaged when a cut occurs on the back of the finger over the joint.

More commonly the central slip is torn, or avulsed (pulled off), from its attachment on the bone when the finger is hit at the fingertip, forcing the middle joint to bend. Sometimes a small amount of bone is pulled off with the tendon. Finally, the central slip can be torn when the middle joint is dislocated and the middle phalanx dislocates towards the palm.

The boutonniere deformity may not occur right away. It is the imbalance in the extensor hood that results from the torn tendon that eventually causes the deformity. Because the middle phalanx is no longer pulled by the central slip, the flexor tendon on the other side begins to bend the middle joint without resistance. The side bands begin to slide down along the side of the finger where they continue to straighten the end joint. Eventually the finger becomes stiff in this position.

### Symptoms

#### What do boutonniere deformities look and feel like?

Initially, the finger is painful and swollen around the middle joint. The middle joint may not straighten out completely under its own power. The finger can be straightened easily with help from the other hand. Eventually, the imbalance leads to the typical shape of the finger with a boutonniere deformity as described above.

### Diagnosis

#### What tests will my doctor do?

Usually the diagnosis is evident just from the physical examination. X-rays are required to see if there is an associated avulsion (pull off) fracture or dislocation of the joint since this may change the recommended treatment. No other tests are required normally.

### Treatment

Treatment for boutonniere deformity depends on whether the injury to the central slip is recognized immediately or if the deformity has been present for a long time. When the injury is the result of a laceration of the finger, the surgeon will usually repair the tendon as well as suture the skin.

## Conservative Treatment

If the injury to the central slip results from a simple avulsion (pull off) of the tendon from the bone, splinting of the middle joint for 6 weeks should allow the tendon to heal and prevent the boutonniere deformity from occurring. The end joint is free to move throughout this period and can be exercised throughout this period to prevent stiffness in the end joint.

While a simple homemade splint will work, there are many splints that have been designed to make it easier to wear at all times. There are also special splints that have been designed that are similar to springs. These splints can be used to gently stretch out a contracture of the middle joint over several weeks. The spring applies gentle pressure all the time and the middle joint slowly straightens.

Splinting and a rigorous exercise program may even work when the injury is quite old. Many hand surgeons will try a six-week trial of splinting with the spring type splint and exercise to see if the deformity lessens to a tolerable limit before considering surgery. This may also be desirable before surgery to stretch out any contracture before repairing or reconstructing the extensor hood.

## Surgical Treatment

The need for surgery and the type of surgery is decided by the hand surgeon looking after the patient, taking into account the age of the injury, how the injury occurred and what structures have been damaged.

All operations carry risks and complications, these will be discussed with the patient prior to surgery.

It will be necessary to have physiotherapy as part of the treatment following surgery.

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