Cervical Disc Replacement

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What is an artificial disc replacement?

- The disc replacement device is typically composed of two metallic surfaces one of which is attached to the upper and the other to the lower vertebra at the affected disc level. These metal implants can then slide on each other directly or can be separated by a piece of medical grade plastic. **The device allows for motion between the two vertebrae to be maintained and avoids the need for a fusion**.

- It is important to understand that disc replacement is a newer procedure with less of a track record than the more traditional ACDF surgery. As a result, some insurance companies may not cover this procedure. More data on disc replacement is being generated every year, however both patients and physicians must understand that this is a newer surgical option with longer term results that will need to be watched closely.

What are the benefits of a cervical disc replacement when compared to the more traditional fusion procedure (ACDF)?

1. Disc replacement **preserves motion** at the affected level, which may protect against accelerated degeneration of the neighboring discs.

2. Since the **bones are not being fused** together, the possibility of a non-healed spinal fusion (called a non-union or pseudoarthosis) is eliminated.

3. As opposed to most ACDF procedures, a **metal plate is not placed** on the front of the spine. This may lessen irritation of the esophagus and **reduce swallowing difficulty** that sometimes occurs following anterior cervical surgery.

Are all patients that are candidates for ACDF also candidates for an artificial disc replacement?

- No. Disc replacement is generally **NOT** an option in the following circumstances:

    1. Adjacent to a previous cervical fusion
    2. In the presence of abnormal motion or instability
    3. Advanced degenerative changes affecting the facet joints in the back of the spine
    4. In the presence of significant osteoporosis

Why is the procedure performed?

The primary indication for cervical disc replacement surgery is a cervical disc herniation. The goal of the procedure is to relieve pressure on the spinal cord and nerve roots by removing the diseased discs. Surgery may be recommended if a patient exhibits:

- Persistent arm pain, numbness or weakness
- Spinal cord compression
- Severe neck pain

Who performs the procedure?

- Cervical disc replacement is best performed by a **fellowship-trained spine surgeon**. Ask your surgeon about their training, especially if your case is complex or you have had previous spinal surgery.

What to expect before the procedure:

- In the weeks prior to your surgery, **pre-operative testing** will be conducted either by your primary care physician or the pre-admission testing department of the hospital.
- One week prior to surgery, you will need to **stop taking aspirin, NSAIDs** or other medications that thin your blood and may increase bleeding.
- If you smoke, it is important you stop well before surgery and **avoid smoking** for a period of at least 6 months afterwards, as this will impede proper healing.
- You will be given instructions and supplies to **cleanse** the front of your neck, the day prior to your procedure.
- You are to have **nothing to eat or drink after midnight** on the night before.

What to expect during the procedure:

- Just before the procedure starts you will have an intravenous (IV) line started so you can receive fluids and medications to make you relaxed and sleepy. The procedure is performed under **general anesthesia** (you are asleep). Medications will be given through the IV to put you to sleep and a tube is inserted in your throat to supplement your breathing. **IV antibiotics** are administered and monitors are placed to check your heart, blood pressure, and oxygen level. A Foley catheter in your bladder is typically not required.
- The procedure typically lasts **1-2 hours,** depending on the specifics of the case. This is what to expect once the procedure begins:

Surgical approach

- You are positioned on your back (supine) on a specialized, cushioned operating table.
- The area of your neck where the incision will be made is cleansed with a special solution to kill the germs on the skin.
- A small, horizontal skin incision is made on the side of the neck area.
- A minimally invasive approach is followed along anatomic planes down to the spine. The limited amount of muscle dissection helps to limit postoperative pain and speed up recovery.
- The important structures of the neck are carefully moved to the side until the bones of the vertebrae and the cervical disk are visualized.

2. Disc removal / Decompression

- The diseased disc and bone spurs are removed so that they no longer exert pressure on the spinal nerves or spinal cord.

3. Placement of the artificial disc device

- After the discectomy has been completed, to prevent the vertebrae from collapsing and rubbing together, the artificial disc is inserted.

4. Closure

- A drain is placed and the incision is closed using absorbable sutures (stitches) under the skin.
- A small dressing is applied over the incision and a soft neck brace is applied. You are then taken to the recovery area.

What to expect after the procedure:

- The procedure is typically performed on an **outpatient or overnight stay basis**.
- In the recovery area, you will be observed until you recover from the anesthesia, then transferred to the floor.
- You will be encouraged to get out of bed and move around as soon as you are able to.
- Pain pills on an empty stomach may result in nausea, so initially IV pain medications are self-administered through a PCA, or **patient-controlled analgesia**.
- IV fluids will be continued until you can drink fluids well by mouth.
- Once you are able to drink normally, your diet will be advanced to your **normal diet** and you will be switched to pain pills.
- **Physical therapy and occupational therapy** will see you prior to your discharge from the hospital to make sure you are comfortable walking, escalating stairs and performing other activities of daily living.
- A soft collar is maintained for about a week.

Recovery and rehabilitation at home:

- Keep in mind, everybody is different, and therefore the amount of time it takes to return to normal activities is different for each individual.
- Discomfort should decrease a little each day, like a dimmer switch as opposed to an on-off switch. Most patients are able to return to most activities by **4 - 6 weeks**, although complete recovery may take between 6 and 12 weeks. You will not be able to drive a car for about 2 -4 weeks, depending on the specifics of your case.
- Signs of infection such as **swelling, redness, wound draining, or fever > 101.5ºF** should be brought to our attention immediately.
- It is important to keep your incision **dry** for a period of 2 weeks to give your incision time to seal. You may sponge bath during this period.
- You will be seen in the office at **2 weeks**, then at regular intervals thereafter. Radiographs will be obtained periodically to assess the healing.

What are the expected outcomes following cervical disc replacement?

In experienced hands, cervical disc replacement is successful in relieving arm pain in **greater than 90%** of patients. However, arm weakness and numbness may persist, as this may signify permanent injury to the nerve. In general, people with arm pain benefit more from disc replacement than those with neck pain.

What are the possible risks?

In skilled hands, cervical disc replacement is a very safe procedure. However, no surgery is without possible risks. These risks can be minimized by choosing an experienced surgeon to perform your procedure, and by adhering to your surgeon's instructions before and after your procedure. General complications of any surgery include bleeding, infection (1%), blood clots, and reactions to anesthesia. Specific complications related to cervical disc replacement may include:

- **Hoarseness and swallowing difficulties.** In some cases, temporary hoarseness can occur if the recurrent laryngeal nerve, which controls the vocal cords, is affected during surgery. It may take several months for this nerve to recover. In rare cases (**less than 1/250**) hoarseness and swallowing problems may persist and need further treatment with an ear, nose and throat (ENT) specialist.

- **Implant failure.** Although very rare, the cervical disc replacement may shift. If this occurs, revision may be required.

- **Nerve injury or persistent pain.** Although the risk is very low, particularly in the hands of an experienced surgeon, any spine surgery comes with risk of injury to nerves or the spinal cord. Damage may result in numbness, weakness or even paralysis.

  To help manage this risk, spinal cord function is monitored during the procedure by use of **intra-operative neuromonitoring**. By measuring electrical signals in the brain and extremities, the surgeon receives real-time feedback on spinal cord and nerve function, thus enabling moment by moment adjustments to the surgery and anesthesia as necessary.

  It is important to note that a common cause of persistent arm pain is nerve damage from the disc herniation itself, not the surgery. Some disc herniations may permanently damage a nerve rendering it unresponsive to surgery. **Like heavy furniture on a plush carpet, the compressed nerve may not spring back**.