

# Vertebral Body Stapling

**Dr. Scott J. Luhmann**

## Post Operative Hospital Pictures





## Important Phone Numbers



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(314)454-6213

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## **What is Vertebral Body Stapling?**

- 1) A new, nonfusion technique used for the management of scoliosis in the thoracic and lumbar spine in skeletally immature patients.
- 2) The concept of stapling the anterior vertebral growth plates for growth modulation and curve stabilization has proven to be effective in animals and humans on the convex side of the scoliosis.
- 3) The effect of the staple is to reduce the rate of growth.

This is a possible alternative to bracing for patients who are at risk for a speedy progression of the curve, and who may need a spinal fusion in the future.

This procedure allows for preserved motion and less chance of back pain in adulthood.

## **Who is a candidate?**

- ❖ Idiopathic scoliosis
- ❖ A child older than 8 years
- ❖ A child who will still have **years** of growth
  - Boys up to 16 years
  - Girls up to 14 years
- ❖ Curve less than 45 degrees
- ❖ Spine Flexibility
- ❖ Neurologically normal individuals

## **Which curves can be stapled?**

Both thoracic and lumbar curves

## **Who designed the staple?**

Dr. Randy Betz has worked to develop the current staple design. At present he and his associates have treated several hundred young scoliosis patients with this technique.

## **How effective is vertebral body stapling?**

Based on personal discussions with Dr. Randy Betz, and his two publications on Vertebral Body Stapling in peer-reviewed journals, vertebral body stapling is equally effective as bracing.

## **What are the advantages of Vertebral Body Stapling?**

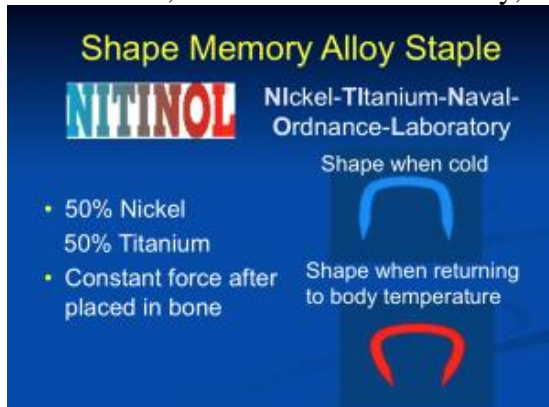
Patients who undergo Vertebral Body Stapling do not need a brace and have an equal chance the scoliosis will not progress to need a spine fusion.

## **What are the disadvantages of Vertebral Body Stapling?**

It is a surgery with all the inherent risks of surgery.

## What type of metal are the staples?

They are a combination of nickel and titanium called NITINOL, for Nickel Titanium Naval Ordnance lab. Nitinol has unique thermodynamic properties that allow it to change its shape based on the temperature of the metal. Near 0 degrees (in an ice bath) the tines of the staple are straight, and as the staples warm to body temperature the tines curve inward, and remain so in the body, in a C-shape.



## What does the procedure involve?

- Patients will have a preoperative visit two to four weeks prior to procedure.
- The procedure is done under general anesthesia in the operating room.
- The procedure is performed with a thoroscope
  - A camera on the end of a long tube which enables surgery to be performed with a small incision on the chest.
  - Staples are placed over the convex side of the curve (usually the right side)
- The procedure is approximately 2 hours in length.
- A chest tube is placed to drain in air and fluid out of the chest for the first 2 days after surgery
- Patients will typically be in hospital for 4 days.
- Patients may spend the first night in the pediatric ICU.
- Patients will then go to the 10<sup>th</sup> floor (the orthopedic floor).

## What happens to the staples?

In the largest series of patients at Shiner's hospital in Philadelphia no staples have broken or migrated. Due to the c-shape of the staples after they are implanted they cannot back out, loosen and travel in abdomen or chest.

## What happens if the curves progress despite the stapling?

It depends on the amount of progression. Slight progression may occur, but likely will not need to be treated (such as a spine fusion). However, significant progression of the curves can still be treated with a spine fusion without difficulty.

### **What do I need to bring to the hospital? You may bring:**

- \_ Current List of Medications, dosages and frequency
- \_ Slip on tennis shoes
- \_ Personal Items of comfort (blanket, stuffed animal, books, movies)
- \_ Toiletry items you feel you will need during your stay
- \_ Comfortable clothes for day of going home

### **Can my mom, dad or caregiver stay at the bedside?**

- In the Pediatric Intensive Care Unit (PICU) two people can visit at a time, but they can not sleep in the room with the patient.
- Parents can sleep in the PICU lounge.
- On the Floor- One parent can sleep at the bedside. The other parent can sleep in the parent lounge. Typically there is not a roommate. If there is not a roommate... both parents are welcome to stay the night.

### **What do we do the night before surgery?**

\*If you live far...you may want to stay at a local hotel because you will be required to be here early. (about 6 am)

**\* The patient may not have anything to eat or drink after Midnight, the means no candy, gum, mints, etc.**



\* Please shower thoroughly shampooing your hair the night prior to surgery and wash with Hibiclens soap from chin to toes.

\* Please remove any nail polish, and be sure your nail beds are clean for surgery.

### **Walking Through the Surgery Steps...**



**Dr. Luhmann:** will see you at the preoperative visit. He does not typically see patients prior to surgery. If there are any questions or concerns prior to surgery, please call Jamie or Jenn before the day of surgery.

## Same Day Surgery:

The 6<sup>th</sup> Floor Same Day Surgery Unit is where you and your family will begin your journey. The day of surgery you will be able to meet with the, anesthesiologist, child life therapist and nurses. Your weight, height and vital signs will be obtained. You may be given medication prior to surgery by the nurse.

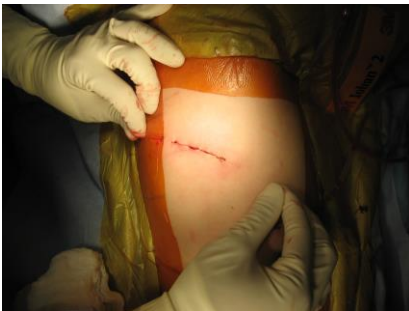
## Operating Room:

You will be able to pick a flavor for the mask that will help us put you to sleep. After you are asleep we will place IVs and lines to give you fluids during surgery and monitor your vital signs. We will have special electrodes placed on your body to check for neuro/sensory movement throughout the procedure



Gel pads and pillows will be used to have you placed in a comfortable position for surgery. Your abdomen/chest will be cleaned prior to surgery with special soap.

You will be asked to complete a “wake up test” after surgery is finished. You will be awake, but will likely not remember this as you will be groggy from medications.



Incision after closure in operating room

## Post Anesthesia Care Unit (PACU):

You will then be wheeled in a bed to the PACU. When you are awake, we will be able to call your parent(s) or caregiver to be with you. In the PACU, you will be closely monitored by the doctors and nurses.



Pain Control You will have a Patient Controlled Anesthesia (PCA).

This is controlled by the Pain Service Team. The pain service team is a special team of doctors (anesthesiologists) and nurses who are trained in monitoring your post operative

pain. If able, to comprehend, the patient will be able to press the button for pain medication. The patient may also be delivered medication continuously through the PCA.

### **Pediatric Intensive Care Unit/PICU:**

- Patients may spend **one** night in the PICU. The PICU is set up to allow close patient monitored care. The nurses in the PICU will have 1-2 patients at a time typically.
- Parents are allowed to visit, but they are not allowed to sleep in the PICU. There is a parent lounge with lockers to hold personal items and chairs that pull out for sleep.
- Patients will be turned approximately every 2 hours while in the hospital. Patients will be turned using the log roll method. The nurses and physical therapists will go over with the family how to turn the patient properly. The physical therapist will be available to get the patient out of bed for the first time the morning after surgery.

Patients will have a chest tube for a few days after surgery.



Dressing placed in the operating room with chest tube.

- The patient will require daily chest x-rays until the chest tube is removed. The patient will also require another x-ray a few hours after chest tube removal. The occlusive dressing placed on patient after chest tube removal will remain on patient for 72 hours.
- Pain medication will be delivered via a CADD or pain pump for the first 24-48 hours. Patients are then switched to medications by mouth for pain.
- It is important for the patient to use the incentive spirometer to decrease complication risk. The patients can also do things like blow bubbles or pretend to blow out candles of a birthday cake. The patient with a history of asthma, CP, or neuromuscular issues will have respiratory therapy treatments.
- Lab work will be obtained for at least the first three days after surgery. The labs are typically obtained through IV access or may need an additional stick.



## **Surgical Floor/ 10<sup>th</sup> Floor:**

### **The typical stay for a patient in the hospital is 4 days.**

Patients are typically transferred to the 10<sup>th</sup> floor which is the orthopedic floor. There are single and double patient rooms. You may have a roommate.

- ❖ The 10<sup>th</sup> floor has a parent lounge and small kitchen with a refrigerator and microwave.
- ❖ Patients are turned every two hours. Patients need to be up out of bed two to three times a day. Parents please ask for assistance if you are unsure or need help getting your child out of bed.
- ❖ Pain medication is adjusted per the Pain Service.
- ❖ It is important for patients to use the incentive spirometer, blow bubbles and or pretend to blow out candles on a birthday cake. All of these decrease risk of lung complications. Some may get respiratory therapy, if needed.

## **Going Home:**



### **The typical stay for a patient in the hospital is 4 days.**

Patients are ready to go home when pain is well under control, tolerating a diet, and cleared from physical therapy.

- Patients will be sent home with a prescription for pain medication and a stool softener. The outpatient pharmacy is located on the first floor near the information desk.
- Try to plan going home with medication timing.
- The ride in the car can often be bumpy! Bring your pink bucket home just in case you get sick to your stomach.
- **2 weeks after surgery** -The patient may shower, bath or swim in a chlorinated or salt water pool. **NO swimming in natural body of water for 6 weeks.**

**No athletic activities for the first month after surgery.**



## **When to call the doctor**

- Fevers-101.5 or greater
- vomiting
- incision site redness, warmth or drainage
- numbness tingling or weakness in your arms or legs
- change in bowel or bladder pattern
- rash
- increased pain not relieved by pain medication

## **Follow Up Appointments:**

- Six weeks- Call Amanda(314-454-4191) to set this up when you are home.
- Six months
- One year

Further follow-up will be individualized to each patient.

## **Resources**

[www.iscoliosis.com](http://www.iscoliosis.com)

[www.srs.org](http://www.srs.org)

[www.ortho.wustl.edu](http://www.ortho.wustl.edu)

[www.stlouischildrenshospital.org](http://www.stlouischildrenshospital.org)

You Tube “ Abby’s Scoliosis Journey”

## References:

1. Betz RR, D’Andrea LP, Mulcahey MJ, Chafetz RS. Vertebral body stapling procedure for the treatment of scoliosis in the growing child. Clin Orthop Relat Res 2005;434:55-60.
2. Betz RR, Kim J, D’Andrea LP, Mulcahey MJ, Balsara RK, Clements DH. An innovative technique of vertebral body stapling for the treatment of patients with adolescent idiopathic scoliosis: a feasibility, safety and utility study. Spine 2003;28:s255-65.

