Bracing used in Scoliosis Treatment

LEXI'S CASE

In January of 2006, we were faced with finding an alternative to serial plaster casting in treating Lexi for her infantile idiopathic scoliosis. Lexi required some hand surgeries which could not be performed with her in a plaster body cast. It was at this point that we realized we would have to explore using a brace to treat her scoliosis.

With the recommendation of our Orthopedist, we met with Dr. Miguel Gomez here in Houston. Naturally, I went into this first meeting very apprehensive. I had reservations about using a brace after the great results we had achieved with the serial casting. After evaluating Lexi, Dr. Gomez went to work, taking measurements with nothing more than a standard tape measure and a caliper. I thought to myself, "this is never going to work." I kept asking myself, "how can something made from mere measurements be accurate enough to obtain any reduction in her curve?" Two weeks later we returned to pick up her brace and have it fitted. Much to my surprise it fit and it looked like it had been taken from a plaster mold. I began to feel a little better about the brace and what we might expect from it.

Since January, I've had the opportunity to learn a little more about Dr. Gomez, his approach to treating scoliosis and the use and fabrication of his braces. To make this an easier read, I am going to present it an interview type manner. I think the questions I asked are easy for us as parent's to understand.

Those of you who know me from the group know that I am in no way opposed to the serial plaster casting. It was just that we, like many others out there, had to explore an alternative to casting. Lexis hand operations were ultimately postponed. However, we have chosen to continue with the bracing since we are getting positive results.

I am going to start off with some history on Dr. Gomez and share the story of how he came into this field. I feel it would be an injustice to him to not share this story with you. I think it lends a lot of validity to his work if you understand how he came to be what we refer to him as, "our brace guy."

Eighteen years ago, Dr. Miguel Gomez was the Chief of the ER department in one of the biggest hospitals in his hometown of Bogotá, Colombia. He had a change of heart in his practice of medicine when he diagnosed his one year old daughter with progressive scoliosis. Since he was a surgeon, he accepted surgery as a viable practice when needed. However, faced with the thought of his own daughter undergoing surgery to correct her spine, he became determined to find an alternative. At the time of her diagnosis, her curve was 14 degrees. When, 2 years later, they had finally exhausted their search in Colombia and South America for another option, her curve had progressed to 48 degrees.

It was at this time they were accepted at Shriner's Hospital in Minneapolis and began treatment with a brace. Dr. Gomez played a role in her treatment as well, taking the position of physician and father at the same time. I am happy to say his daughter is now 22 years old and not only has a stable, healthy spine, but also never needed surgery in correction of her scoliosis.

Inspired by the treatment of his daughter, Dr. Gomez began to pursue a better understanding of orthotic treatment of the spine by enrolling in the Orthotics and Prosthetics program at Century College in St. Paul Minnesota. The program was initially very challenging, in that Dr. Gomez spoke little English. However, he dedicated himself to learning and completed the 3 year program in 18 months. After completing the program, he spent 18 months at the Gilette Childrens Hospital, splitting his time between spinal orthotics and spinal surgery. With this knowledge base, he returned to his native Colombia to introduce conservative orthotic treatment to that nation. Ten years later, he received an invitation from Bioconcepts, an orthotic company in Chicago with close ties to Northwestern University, to join their team of spinal experts, clinicians and researchers. He later went on to direct the Orthotic Department at Duke

University. He has now devoted is time to working both as a clinician as a consultant in spinal orthotics. He personally manages spinal patients in Houston Texas, through Dynamic Orthotics and Prosthetics, while consulting on patients from across the country.

Below you will find the answers to questions I wanted to know and share with all of you who may need to explore the option of bracing. Dr. Gomez was kind enough to take the time to answer these. He has answered them from a clinical standpoint as well from the standpoint of a parent who has traveled the road of Infantile Idiopathic Scoliosis like we are all doing at this time.

You have shared your daughter's own story with Scoliosis with me. You said her curve was managed and she never needed surgery to correct her spine. That is an inspiration to me and gives me faith in you treating my daughter. However, it has been said by various members of the orthopedic community that in children with Progressive Infantile Idiopathic Scoliosis if the curve continues to progress, the infant or toddler will be fitted with a brace. These external devices are designed to slow or arrest the progression of the curve. Unfortunately, they cannot correct the problem and only hold the curve until the child has achieved skeletal maturity.

What is your reaction to this statement and do you believe in some cases that bracing can get correction of the curve and eliminate the need for surgical intervention in adolescence? Are there any positive statistics out there in which braces have corrected and managed a curve so surgery is not needed?

In addition to watching the treatment of my daughter, I have had the opportunity to manage over 3000 scoliosis cases. As a surgeon and an orthotist, I'm familiar with the benefits and drawbacks of both approaches. I think that, in some ways, good orthotic treatment can be more demanding and difficult for the patient than surgery. For the patient, surgery is a very passive procedure. The surgeon plans his approach and after 4 to 8 hours, it is done. Orthotic treatment demands more from both the patient and the rest of the entire group. It is a sacrifice because it is long, long treatment and requires daily, active participation of the patient.

With regard to conservative treatment of idiopathic scoliosis, there are several studies that demonstrate that orthotic treatment and surgery are the only 2 ways to change the natural history of curve progression. If you can prevent the curve from progressing beyond the initial Cobb angle measurement, than you have met that criteria. There are several studies that have demonstrated the ability of bracing to do that. However, I think there is more to it than that. Each curve needs to be considered individually and the expectations of treatment adjusted accordingly. How flexible is the patient? How mature is the patient? How much we will be able to control that particular deformity? With some patients, I don't feel bad if we don't reduce the curve. For other patients, it is reasonable to expect a permanent reduction between 10 to 25% of the initial curve. Each case has to be watched individually, because bad braces can be as dangerous as bad surgeries. Unfortunately there is no turning back once the spine loses its flexibility. Like I say, "Flexibility will be our best player or our worse enemy. It depends how we will use it!"

Also, there is more to it than Cobb angles. The patient should be well balanced and stable. It's fine to have curves if they are well compensated on the spine. But these are unique ideas. It is necessary to reeducate new generations of doctors, orthotists and PT's to believe and understand these principles.

A great possibility to find the right treatment for scoliosis is through a group like ISOP. I wish I had access to this option when I was searching around for my daughter. I would love to be a part of this "Infantile Scoliosis Group" and be more aggressive with respect to education.

I have shared my story of Lexi and our experience with you to the other mom's in my group. I have told them your approach to treating Lexi is based on more than just her "curve". You also

look at balance and symmetry of the patient. Those who have used bracing in the past with miserable results said their orthotists never looked at that with their children. This may be a tricky question, but do you feel there is a population of orthotists out there who do not know how to properly treat Infantile Idiopathic Scoliosis and just concentrate on the degree of the curvature rather than the patient as a whole?

I respect most Clinicians (Orthotists) in this field, and I know that the majority will do the best for their patients. I also know that they tend to use whatever treatment is available, affordable, commonly used and well studied. There are a few popular companies that meet some of these criteria (Boston, Spinal Tech, Providence etc.). Unfortunately, I have to say that when some Orthotists are treating spine deformities, they are focusing more on the type of the brace they will use than the real biomechanics of the individual deformity and treatment plan. We have to treat every single case differently and that takes a lot of thinking and planning.

If we review the components of the Scoliosis, it is always described as a 3 plane deformity (Coronal, Saggital, Transverse), Most popular spinal orthoses fail to approach these components properly, or concentrate too much on one plane while ignoring the others. Again, they focus primarily on the Cobb angle in the coronal plain. Spine orthosis can create other deformities in other planes (Flat Back, Hypolordosis) and those can be as bad as the Scoliosis. Again, we have to train doctors and the orthotists as a group to see the same picture and establish the same goals in every individual case.

I have read in a newsletter that you have developed a technique using CAD-CAM technology to eliminate the need of making a mold when measuring for a brace? Do you feel this method gets more accurate measurements and allows you to make a better fitting brace?

Yes, in the last 4 years, I've used the CAD CAM approach more often to ensure that we make the best use of good clinical and radiological signs to establish an individual biomechanical approach for every single case. Now days, I take more time evaluating the patient, testing range of motion, and assessing flexibility, rather than molding the patient. Many times, when I took the plaster mold I wasn't comfortable because I saw good correction in one plane but problems in other planes. This required a lot of time, modifying the mold by hand to fix these problems. With the computer, making these changes it is easier, more accurate and more reliable. Also, I can measure every single modification, so it's more reproducible. Also the file will be in my computer, so I will have the perfect way to compare the shape of the spine and deformity throughout the entire treatment. This is a dynamic treatment and very often the shape of the curve(s) change; many times we will see at the end of the treatment that a single curve will end with one or two compensatory curves. This will sound crazy but some times we will allow the spine to create a small curve or curves to get the most stable position, keeping balance and stability.

I did read you are still perfecting on this technique, but will other orthotists around the Country become aware of this method and start to implement it in their practices or are you keeping this secret all to yourself?

Tracey, more than anything I'm an educator. I fully understand the value of good conservative or surgical treatment. Any time that I have an invitation to lecture about this system, the "Gomez Orthotic System," I'm taking the time to participate. I had the opportunity to lecture at the national meeting of AAOP (American Academy of Orthotists and Prosthetists) in 2004. I also lectured at a workshop in 2005 at the Texas chapter of the American Academy of Orthotists and Prosthetists in Austin TX. This year I will lecture again and have another workshop related with this new approach. I would love to teach more and more clinicians to evaluate the patients properly, find the right information, and take good measurements. They can send this information to me and I will modify the case by computer and send the file back to them so they can fabricate the brace or ask a central fab company to do it. I'm always looking for clinicians that I can work with. So far, I have found my expertise with Cad Cam to be the best tool for

creating a brace that matches the appropriate biomechanical plan for each individual patient. But it's not a simple recipe from a cookbook. Every case is unique and treated in a different way.

X-rays taken during treatment…….. How often do you feel a film is needed in looking at the curve? As a mom, I would love to be able to see my daughter's spine as often as possible during treatment. Aside from the risks of exposure, how necessary are these during treatment of the scoliosis?

X rays during treatment . . . good question. Of course the most important films are the first one, prior to interventions, and the last one after treatments are complete. These are necessary to ensure that the treatments have accomplished the goals. Between these, I have typically seen a set of x-rays taken every 4 to 6 months. Unfortunately, while x-rays give you a lot of information, they don't give you all the information, particularly with respect to balance. Many times, the technique used to take the x-rays isn't appropriate, so the information is not real. I like to take digital pictures every visit. To me cosmetic appearance is very important, so are balance and stability. Again, these clinical signs are more important in some ways than radiological signs! In other words we have to treat the patient, and not the x-rays. If the information from these doesn't match, we have to trust the clinical signs. That is why it is so important to carefully evaluate each patient.

Failure to comply with wearing the brace as prescribed… would you say this is a big issue with your younger patient's and if so, what do you say to these parent's who do not enforce the time needed wearing the brace?

This part of the treatment is one of the most important. We can provide the best treatment through an individual brace, but if the patient doesn't wear it, it will not do the job! I always compare brace wearing to taking an Antibiotic. If your child has an infection and the doctor prescribes an antibiotic with a specific dose, say 250 mgs every 8 hours for 5 days, it is best to follow the instructions. You can't expect optimal results when the protocols aren't optimally followed. This becomes even more confusing with companies offering night time bracing and strapping techniques that may be easier to wear as prescribed.
Maybe it will be easier for the patient and the family, but how many of these patients are ending up in surgery? We have to be sensitive to this issue, and make braces as comfortable as possible, without sacrificing the effectiveness of the treatment.

What is the age of the youngest child you have treated for scoliosis?

The youngest case of Idiopathic scoliosis that I have treated was a case from Colombia, she was 1 year old. She is now 16 and never required surgery. The youngest case of Congenital scoliosis, (hemi vertebras and Unsegmental bars) which is more involved, was a boy I started to treat when he was 7 months old. He is now 14 and has had just one surgery. The youngest case Neuromuscular scoliosis, (Cerebral palsy), was around 2 years old. The braces for these population is to provide the best sitting support and prevent progression on the curves.

What is your best advice to my moms on this group who are considering a brace when they go out to find an orthotist to treat their child? What do they need to look for in that person and are there any questions they really need to ask him/her?

First, parents need to read together as much as they can about Infantile Idiopathic scoliosis. Second, find a web page like you have, and find a good advisor. Many times this is another mom that had the same problem or situation with her child. She or he will give you her personal experience, good or bad, with this particular device or company. Third, visit at least two doctors of your choice and find out if they are in favor of the conservative treatment using braces. Fourth, visit at least 2 orthotic companies and find out who is in charge of the spine services or spine department. Just remember that this treatment will take several years and your child has to be comfortable with all the people involved in their treatment.

I want to thank you so much for your time in answering these questions. The mother's on the ISOP group have listened to me rant and rave about you since you have been treating Lexi.

Some of their children cannot wear the casts at this time for different reasons and want to explore bracing as a treatment due to this. Hopefully, they will gain some insight from your expertise in this field.

Tracey, I really appreciate this opportunity to share my knowledge and experience in this. I completely understand how stressful it is for the child and the family in dealing with the braces everyday. It is even worse when we as parents don't know if the brace is doing the job. Parents are the best clinicians if they know what to look for and how to evaluate it in simple ways. Part of my goal is to train parents on this treatment, so they will know what to look for and expect!

If there is anything that I did not think of that you would like to add to this, please share it with us. As a mother I know we all want to be as informed as possible.

I just want to add that the sociological part of this process is very important and it depends on how we as parents accept this challenge. We can create problems or be a factor in prohibiting them.

I always recommend involving the child from the beginning. Ask for their opinion; let them decide on the color of the brace etc, in the end they are the ones who have to wear this device. Just think for a moment, are you willing to wear the brace as your child is?
Keep in mind that these braces are not torture devices. Do not use it if it is creating damage to the skin, ulcers, or any other problems.
To avoid these problems it is necessary to visit the orthotist who is following the case at least every 2 months.

For those of you like my family, who have to consider options besides casting, I hope this information is useful to you. Let me be clear in the fact that Dr. Gomez is sharing his experience with treatment with the use of braces. None of the information above is meant to reflect at all on Serial Plaster Casting. This information is intended to educate those of us who may have to explore bracing for our children.

I want to say I am still a proponent of casting. We had great results with Lexi's casting and I will continue to support the work of Miss Mehta and the other Doctor's practicing this technique. Of course my support will always go to Heather in her relentless pursuit of helping Olivia and helping all of us along the way as well. My personal thought at this time is that we are getting positive results with our choice in treatment and we feel comfortable with this. We have just been very fortunate to find Dr. Gomez and have at our hands his wonderful expertise in orthotics and his exceptional approach in using these devices in the treatment of Scoliosis.

Remember that we are all in this for one reason and one reason alone…to find the best treatment out there for our children in hopes that they can be corrected to a position where surgery is never the answer for them