

The Structural Fingerprint™ Exam: Bill Rodgers

by Tim Maggs, D.C.

Fig. 1



IN THE PAST TEN YEARS, I'VE RECEIVED MANY EMAILS from injured athletes. Injuries are part of all athletes' lives but, when the injury prevents them from participation, they get crazy. Injuries are a part of all athletes' lives.

Except one: Bill Rodgers, the famed marathoner who's finished first four times each in both the Boston Marathon and the New York Marathon. He's run fifty-eight marathons, and, to this day, still logs sixty miles per week. Except for a spiral fracture of his right tibia two years ago, Bill has been blessed, at the very least, with great genetics. He's suffered with short bouts of plantar fasciitis and achilles tendonitis but, all in all, the leg fracture was the most severe injury he's ever had.

I recently traveled to Boston for the sole purpose of performing a Structural Fingerprint™ Exam on one of the greatest athletes ever. The purpose of this biomechanical exam was not to determine the diagnosis of an injury identified by an ICD code that will produce re-imburement. The purpose of this exam was to determine the biomechanical status of his structure, to see what effect fifty-eight marathons and fifty-eight years with a lifetime of stress has done to his body, and then to design a proactive program to help Bill biomechanically improve and correct the defects we find. In essence, how can he preserve his structure to maintain a future of running?

The Structural Management™ Program

This program is designed to guide the practitioner through a step-by-step procedure to determine biomechanical defects, which have been shown to lead to injuries, perpetuate injuries and accelerate degenerative changes. Once the defects are determined, a corrective program is designed to help the athlete reach "maximum biomechanical improvement," a status all athletes should aspire to reach and maintain.

Once the biomechanical defects are determined with The Structural Fingerprint™ Exam, the corrections can be made by any or all of the following modalities: custom orthotics, chiropractic adjustments, extremity adjustments, rehabilitative exercises, cold laser therapy, nutritional support, physical therapy, weight management, conditioning exercises, etc. The doctor chooses the best combination of actions for each patient, based on the findings of this exam. These, in combination with time, will produce results.

Bill Rodger's Structural Fingerprint™ Exam

The exam begins with a history, to determine if the patient has been through a biomechanical exam recently, asks if the patient wears custom orthotics, checks if the patient has had recent standing X-rays as well as other relevant biomechanical questions. The concerns go way beyond any current injury.

Bill was excited to go through this exam, as he's had questions regarding imbalance and left hip issues for many years that no one has been able to answer.

"I lean to the left when I run, and I know that's not right, but no one has been able to give me answers when I ask them". Imagine that, the greatest marathoner of all time, and no one can tell him why.

We first looked at Bill's feet, and determined he was a supinator in his younger life; however, his left medial arch has now begun to fall (Fig. 1), as seen on the digital scanner (Fig. 2). This begins the kinetic chain imbalance. His leg lengths were uneven, as he had an anatomical 5/8" shortness of his left leg (Fig. 3). Bill determined on his own recently that he needed a lift in his left shoe, so a 1/4" lift was worn during his standing X-rays.

Upon further examination, it was noted he had restriction in the low back on extension. This is typical with the aging process; however, loss of mobility contributes to the acceleration of degenerative changes and encourages compensation; therefore, the goal is to restore mobility and flexibility as much as possible.

It is also important to examine the wear of an athlete's shoes, as the wear patterns should be more evident than the wear patterns on everyday shoes. In Bill's case, the wear patterns show a significant difference, right vs. left (Fig. 4).

When evaluating the left hip, there were signs of restrictions in and around that area. The right hip showed no tightness or restrictions. In Fig. 5, we rotate inward both feet/toes, and the left foot rotated inward further than the right. This is suggestive of a variety of possibilities, including a rotation of the pelvis, a tightening of the major hip flexor muscles, and/or other less possible biomechanical changes.

In Fig. 6 (See Pg.44), we rotate the hip joint by using the ankle as a lever, both inward and outward. Again, this will show if either hip joint has lost mobility, especially compared with the opposite hip. In this case, the left hip has a significant restriction

Fig. 2

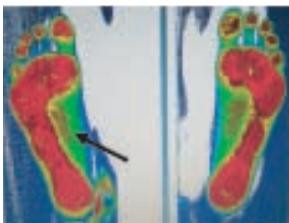


Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10

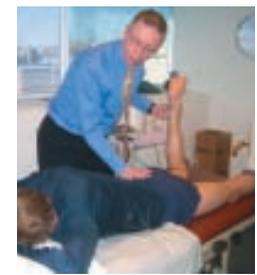


Fig. 11

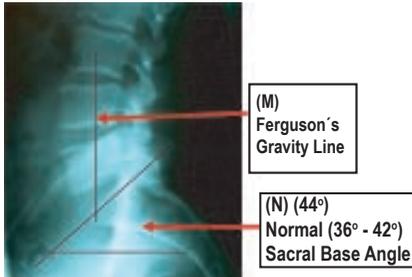
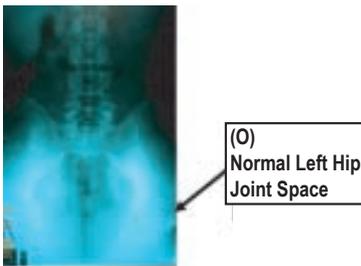


Fig. 12



of mobility, as compared to the right, when rotating the thigh inward.

When performing Patrick-Fabere, the right knee easily reaches the table, while the left knee is restricted (Fig. 7). The reason the left leg rotated in further than the right (Fig. 5) and the reason the knee will not go down to the table on P-F Test is due to a pelvic rotation as seen on the A-P L-S X-ray. The yellow line represents the symphysis pubes, while the red line represents the center of the spine. The same line should bisect both points. Another important part of the exam is to check the major muscle groups for trigger point activity. Trigger points are produced by repetitive activity, trauma, and increased demands on a muscle. We find that the left piriformis muscle is tighter and more tender (Fig. 9), most likely as a result of the pelvic and foot imbalance. Both quadratus

lumborum muscles of the low back were involved, while both calves were negative for involvement (Fig. 10).

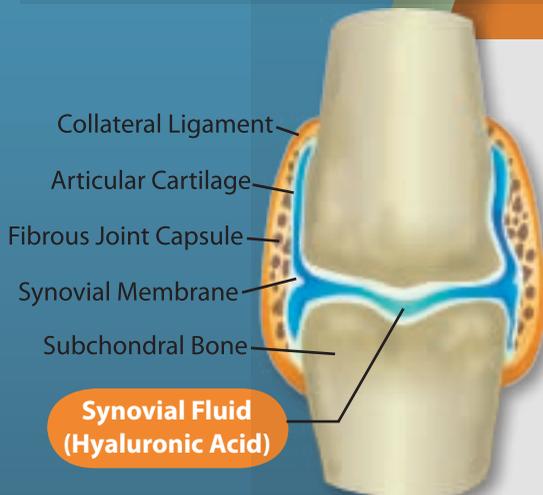
X-Ray Exam

The biomechanical X-rays, which provide seventy-five percent of our information, were very interesting. Starting with the lateral L-S (Fig. 11), we found tremendous balance and great biomechanics, which probably has a lot to do with his good genetics. The center of gravity (Ferguson's Line) originates at the center of L3 and bisects the anterior third of the sacral base. This suggests the weight in the low back is being handled efficiently. In addition, the disc spaces in the low back are plump and full, despite the amount of stress his structure has endured over the years.

We also wanted to look on the low back X-ray to determine the status of his hip

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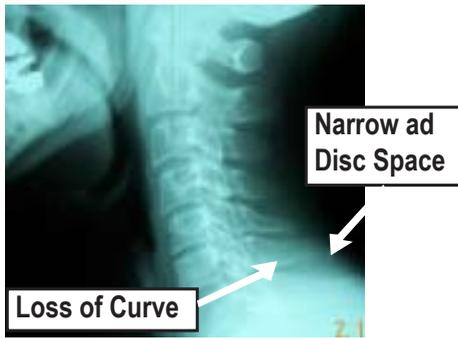


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Fig. 13



joints, especially the left hip (Fig. 12) (Pg.44), due to the restrictions we found on the exam. Fortunately, the left hip joint showed minimal wear, as the joint space looked healthy.

The standard X-ray series on The Structural Fingerprint™ Exam also includes an A-P open mouth and a lateral cervical. The results of Bill's neck X-rays were generally good, however, the lateral cervical (Fig. 13) showed some reduction of normal curve, an anterior weight bearing line and also some wearing of the fifth cervical disc space.

Conclusion

Bill's overall biomechanics are excellent as compared to the average fifty-eight year old, but even more so in light of the miles he's run in his life. With that being said, there are definite biomechanical improvements that must be made in an effort to preserve both the musculoskeletal system as well as the neuromusculoskeletal function.

In this case, the anatomical short left leg has most likely contributed to the dropping of the left medial arch over time, which then begins the process of changing the normal centers of gravity in the entire kinetic chain. If not addressed, this progressive change will accelerate the potential breakdown of one or more joints in his body. The muscle tenderness we found is typically a result of these muscles working harder than desired, almost like guy wires on a leaning flagpole. With Bill running sixty miles per week, these imbalances, left unattended, are more likely to lead to muscle/tendon injuries.

The rotation of the pelvis, causing the left hip to sustain more stress than the right hip, also predisposes Bill to premature breakdown, which was seen last November with the injury he sustained to that hip. Specific changes need to be made in his overall biomechanics in an effort to reduce the abnormal stresses on that joint.

The 3 goals of **The Structural Management™ Program** are

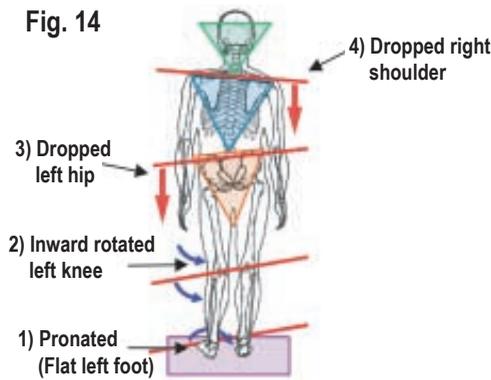
- 1) To improve structural balance,
- 2) To increase joint mobility,
- 3) To improve muscle flexibility.

These goals are a never-ending effort, and the following recommendations are designed to help Bill reach his ceiling of biomechanical potential. Once there, we then want to help him stay there as long as possible. This improvement will ultimately help reduce the likelihood of both future injuries and degenerative changes.

Recommendations

- Custom fitted orthotics, with a progressively increasing heel lift on the left. We will use flexible orthotics that were

Fig. 14



measured in the weight bearing position (on our digital scanner). We will begin at a 1/4" lift, and progress up to 3/8" and possibly 1/2". These orthotics should be worn in as many shoes as possible, not just when running. The balancing of the feet will help to improve the structural imbalances above, as well as minimize future dropping of the medial arches of the feet.

As you can see from the Figure 14, there is a chain reaction with imbalances in the arches of the feet.

- Continue his once per week full body massage, with special attention shown to the left gluteal/hip region.
- Begin a once per week program to receive chiropractic adjustments, which will help to increase mobility in the joints of the feet (left big toe), knees, hips, pelvis and spine, as the narrowing of the C5 disc space is directly proportionate to a loss of normal joint mobility. The restriction in the low back on extension will also improve with full structural adjustments. Finally, his body will better tolerate daily stresses, such as with each step of running, when there is normal and full mobility in all joints of the body.
- Consider two nutritional supplements, including a glucosamine supplement, which is food for the joints, in an effort to feed and preserve them, as well as a proteolytic enzyme, an all-natural anti-inflammatory supplement that also works to accelerate soft tissue recovery, especially from the demands of running.
- There are specific rehabilitative exercises that can be done for both balance and mobility, especially in the neck and low back.
- It is recommended he employ the use of The Stick in combination with a stretching program, and the "Instructions" can be found on my website (www.DrTimMaggs.com), under Muscle Management, found on the Structural Management™ Pyramid. This should only take ten to fifteen minutes per day; however, the increased flexibility will dramatically help our overall goals.
- I would recommend "cushioned" running shoes, as Bill's high arches typically are more rigid with less shock absorption capability. Additionally, the large toe on the left foot should tolerate cushioned shoes much better.
- If any injuries do occur while undergoing this program, they should respond to treatment much quicker.
- I would recommend re-evaluation in six months to see if we are on course with our goals. We will re-scan the feet, perform the (+) finding tests again, and re-take one or more X-rays for comparison.

This type of program would benefit every athlete out there, and would dramatically increase the desire for our athletic communities to seek out chiropractic care. We must get away from only providing medical model assistance, and begin raising the awareness of applicable biomechanics in the form of Structural Management™.

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