Illustrative Case Studies

Case 1

A 41-year-old Caucasian woman presented with chronic low back pain and stiffness for 2 years.[1] The pain gets worse after inactivity and wakes her up late at night and early in the morning. She feels better after physical activity. The onset of low back pain was preceded by episodic alternating buttock pain for about 2 years. She also had chest pain that is accentuated when sneezing and coughing. Her back has gradually become stiffer, which has caused her difficulty in performing activities of daily living. She had eight episodes of HLA-B27–associated acute anterior uveitis during the last 20 years and upper back pain (between shoulder blades) and sometimes pain in the lower cervical spine for 10 years.

She had seen many doctors and had many tests, including radiographs and bone scans. She had been previously treated with full doses of different NSAIDs without much relief. She was told she had fibromyalgia. Her personal and family medical histories were unremarkable. On examination, she walked with a slightly stiff gait. She had tenderness over lower cervical spinal processes, over the whole thoracolumbar spine, and over both SI joints. She had diminished lumbar spinal motion in all planes (modified Schober's test showed only 2 cm mobility). Her neck motion was decreased in all planes. Chest expansion was only 3 cm. Her BASDAI score was high, indicating active disease.

Laboratory tests showed elevation of ESR and CRP. A recent radiograph of the pelvis did not show definite evidence of sacroiliitis. MRI (STIR technique without gadolinium enhancement) clearly showed areas of edema of the sacrum and ilium adjacent to both SI joints, indicative of bilateral sacroiliitis and confirming the clinical diagnosis of axSpA.

This case exemplifies the frequent difficulties in establishing a definite diagnosis in the absence of sacroiliitis on conventional radiograph. It also confirms the role of MRI in making the diagnosis very clear. This patient was subsequently treated with a TNFi with excellent response. If we apply the concept of positive likelihood ratio (+LR) product here without knowing the results of the HLA-B27 or the MRI, we will have the following result: +LR product equal to 56 (3.1 × 7.3 × 2.5; +LR for inflammatory back pain, acute anterior uveitis, and elevated CRP/ESR), which corresponds to a post-test probability of about 75%.

Knowing that the HLA-B27 was positive will bring the +LR product up to 509, which corresponds to a post-test probability of 96% before knowing the results of the MRI. This exemplifies that a positive HLA-B27 can facilitate the diagnosis when conventional imaging is inconclusive and MRI is not available or feasible. To be mathematically correct, one needs to point out the above mentioned +LR is an overestimate because the clinical items it is based on are not totally independent.

Case 2

A 41-year-old Middle Eastern woman presented with severe back pain and stiffness that did not respond to full doses of different NSAIDs. She had seen many physicians in more than one country, and her pain was thought to be due to active inflammation from her long-standing AS. She recalled that she was treated with methotrexate at one stage, which caused hair loss but did not relieve her symptoms. She was told that conventional radiography showed typical changes of advanced AS with bamboo spine.

A detailed clinical history revealed that her back pain worsened with physical activity, and radiography suggested the presence of discitis or pseudoarthrosis in her lumbar spine. MRI demonstrated pseudoarthrosis of her mid-lumbar spine was the cause of her pain. Initial treatment with a lumbar brace did not help, so she underwent spinal fusion with two metal rods, and subsequently all her pain resolved. This case exemplifies the importance of vigilance for the complications of AS.

She subsequently had my (MAK's) book (*Ankylosing Spondylitis: The Facts*, published by Oxford University Press; written for AS patients and their families)[3] translated into her native language, and she distributed free copies of it to AS patients and health care providers at her own expense. A few years ago she underwent a successful hip arthroplasty.

Case 3

This is excerpted from the story I (MAK) wrote of a remarkable Swiss gentleman who was born in 1931 and had suffered from AS for more than 72 years.[2] His symptoms began at age 12 and he had already developed impairment of his spinal mobility by the time he reached high school so that he was unable to join in his school gymnastics or play with his friends or do skiing. His disease was finally diagnosed in 1953 at age 22. He was treated with a 3-week course of spinal radiation that was being used to provide some benefit for patients with severe disease. He was then working as a teacher at a grammar school and was called up for military training service but was not accepted because of his AS.

By the time he married in 1957, his back pain and stiffness had become so much worse that he needed his wife's help in washing, dressing and even getting into and out of his bed. Within 10 years after diagnosis, mobility of his whole spine was markedly impaired, including his neck. He received a second 3-week course of spinal radiation in 1962 that brought a certain degree of relief but it greatly undermined his general health.

During his job as a school teacher, he started taking classes at a university in his spare time, and after nine years he obtained his PhD in biology. But this double burden over those years had sapped his health almost to a breaking point, and his wife and two daughters had been through very hard times. At first, physical therapy merely made matters worse and only gradually did he become aware of small improvements and overcame his resistance to physical therapy, and together with daily use of NSAIDs helped him to increase his mobility to some extent, although his whole spine had become stiff, his breathing restricted, and his muscles weak. But he

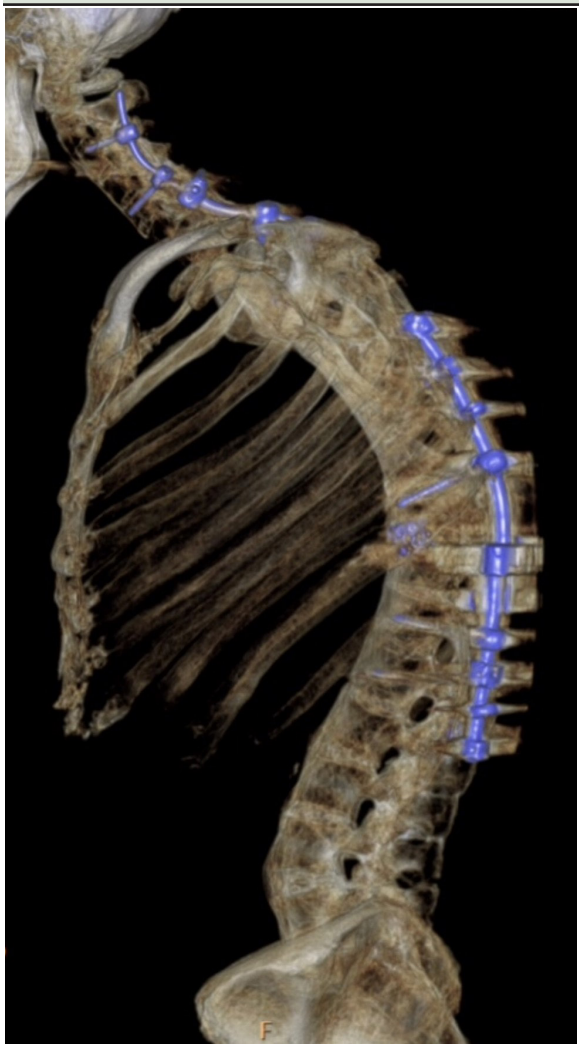
was finally able to sleep better after about 15 years of not having had a proper night's sleep. From that time onwards, he regularly went every year for a 4 weeks of intensive physical and spa treatment and water exercises. The pain in his back, chest, and neck finally abated about 35 years after the onset of the disease, and he started enjoying this new lease of life.

He suffered from primary AS, without any associated psoriasis or IBD. None of his immediate family members had AS or related types of spondyloarthritis. He did possess HLA-B27 and had many episodes of acute anterior uveitis; his most recent episode was very severe and was associated with macular edema. He had spinal fractures on three different occasions. His first spinal fracture was of anterior wedge compression type involving three lower thoracic vertebral bodies (primarily T10) that occurred at age 50 due to a fall on ski slopes and it resulted in marked thoracic kyphosis.

The second fracture occurred at age 62; it was a trans-discal fracture (between T8 and T9) that led to pseudoarthrosis, resulting in surgical fusion along with correction of his thoracic hyperkyphosis. That surgery took 8 hours to perform the osteotomy at T10 and spinal fusion from T5 to L2 by metal plates and screws (**Figure 20.1**). He regained 10 centimeters in height after the surgery, and this also relieved him from his cardio-respiratory compromise that had resulted from his marked kyphosis.

His most recent spinal fracture was 6 years ago when he fell at a rehabilitation center and fractured his lower cervical spine (between C7 and T1) (**Figure 7.3**). This fracture happened a couple of days after his discharge from a hospital following treatment of severe subcutaneous infection with abscesses and lack of healing after an excision of six basal cell carcinoma lesions on his lower back that looked cancerous. The biopsies had revealed basal cell carcinomas that were attributed to his two courses of spinal radiation, a known complication of such treatment. The problems with healing and infection were attributed to the radiation-associated extensive subcutaneous fibrosis that prevented surgical closure of the skin surrounding the resection sites.

FIGURE 20.1 — X-ray Showing Spinal Kyphosis and Surgical Fusion of Spinal Fractures



X-ray of thoracic and lumbar spine (lateral view) showing surgical fusion of a relatively recent spinal fracture between C7 and T1 vertebral bodies. The X-ray also partly shows previous spinal osteotomy at T10 and fusion from T5 to L2 by metal plates and screws.

It was only in 1971 that he first met a fellow sufferer from AS and it was a great help to him to meet other patients as well and hear their experiences with their disease. As a result of those conversations, an idea was conceived by him to start a patient support group to educate, help, and support each other. This finally led to the formation of such a group in 1977 by him and three other patients. A year later 155 individuals attended the first meeting of the "Schweizerische Vereinigung Morbus Bechterew" (SVMB) or the Swiss Ankylosing Spondylitis Society in English. They later found out that theirs was the second such AS patient support group in the world. He made more than 45 trips abroad, lecturing and participating in various meetings and congresses in Europe, Asia, and the Americas in his zeal to spread the idea of self-help organizations for patients with AS.

He also took upon himself to gain extensive knowledge about AS and has co-authored with his rheumatologist an excellent and very well-illustrated book on AS for patients and their family members, as well as for healthcare professionals.[4] His knowledge about the occurrence of spinal fractures in AS and how medical emergency services should handle patients with presumed spinal fractures was very instrumental in preventing spinal cord damage after each of his three spinal fractures.

I had come to know this remarkable gentleman for the first time in 1983 in London, England after my lecture at an international scientific meeting on HLA-B27 and heard about his struggles with AS, including his spinal fracture that happened in 1981. I did not tell him that I had sustained a fracture of my ankylosed cervical spine a day earlier in Bigend, a small town in Wales. Thankfully my fracture was non-displaced and stable, and I was flying back home later that day to get treated.

He survived many manifestations and comorbid conditions associated with AS, and finally passed away on September 23, 2020, 3 months short of his 90th birthday, having lived with a severe form of AS for 78 years. I had met him and collaborated with him many times since 1983, and my last communication with him was 10 days before he passed away when he was very delighted to know about the acceptance of our six scientific abstracts

for presentations at the ACR 2020 annual scientific meeting that are based on a 35-years-long study on AS that could not have been performed without his help. He had fully enjoyed his long and very productive life, and left behind a very supportive wife (they had been married for 63 years), two daughters, two grandsons, and many grateful patients and healthcare providers worldwide.

A Personal Note

I (MAK) would like to mention that I myself suffer from AS that began at age 12, unassociated with psoriasis or IBD. I do possess HLA-B27, and have a strong family history for AS. I am under care of my cardiologists for hypertension, coronary artery disease, calcific aortic valve stenosis, and bradyarrythmia. I have a past history of recurrent acute anterior uveitis, bilateral hip arthroplasties with revisions since 1976, cervical spine fracture requiring surgical fusion, coronary artery occlusion requiring a stent placement, tophaceous gout, and right nephrectomy for renal cancer.[5]

My surgeries have posed challenges for both the anesthesiologist and the surgeons, and when about 9 years ago I needed a trans-sphenoidal resection of pituitary macro-adenoma, four renowned neurosurgeons at famous institutions expressed their refusal or reluctance because they perceived difficulties with general anesthesia and inadequate visualization of the surgical site caused by my completely immobile and stooped neck.

I finally requested the fifth neurosurgeon to first perform a tracheostomy so that subsequent tracheal intubation would provide him with easier trans-nasopharyngeal access. He followed my suggestion and I am very grateful to him for a successful operation. I subsequently decided to continue wearing a tracheostomy tube for any future need for general anesthesia. I have had prolonged respiratory care after general anesthesias due to restricted chest expansion, further complicated by asthma and obstructive sleep apnea that requires the use of BiPAP machine at night.

I may add that in April 2021, I had a cardiac pacemaker implanted for my bradyarryrhmia (probably related to my longstanding AS). and, at my request,

the procedure was performed under local anesthesia, although it was not totally pain free. It so happened that it took place a week after my 77th birthday. It is also worth mentioning that at the time of my first surgery for simultaneous bilateral hip arthroplasties in 1976, I had requested spinal anesthesia but lumbar puncture could not be performed due to my completely fused spine. However, the surgery could be accomplished with mostly spinal epidural combined with some general anesthesia.

I decided to share some of my personal experiences facing adversity imposed by my AS, hoping that the readers will appreciate the dire need for early diagnosis, effective management, and prevention or retardation of spinal ankylosis that imposes its own problems for patients with this disease that is as common, if not more common, than rheumatoid arthritis. Lastly, I would like to share my picture with the Case 3 individual (Heinz Baumberger, PhD) taken at the balcony outside the historic VIP dining hall at the top of the tower of the University of Zurich, his alma mater. Astute observers may have noticed that this picture must have been taken in earlier times because I cannot wear a necktie anymore since the tracheostomy.

FIGURE 20.2 — The Author (MAK) With Case 3 – Heinz Baumberger (right)

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