

Benign Hypermobility in a Flutist: A Case Study

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Abstract

In recent years medical knowledge of hypermobility syndrome has increased but little attention has been paid to musicians and problems associated with abnormally flexible joints. Although anecdotal reports in violinists are well known, no previous reports concerning flutists exist. This paper describes a college-level flute student with benign hypermobility leading to technical difficulties in her musical repertoire. A therapeutic program consisting of education, adaptive devices to the flute, blocking splints for the joints of her fingers, and an exercise program significantly decreased her extreme range of motion, thus improving her technique and allowing her to progress in her music studies.

Interest in joint hypermobility has expanded in recent years with several articles and an extensive monograph adding to the knowledge base of classic literature.¹ Nevertheless, little attention has been paid to musicians and problems associated with abnormality flexible joints. Studies in progress suggest that hypermobility is found

more frequently in performing artists than in the general population and may lead to significant problems in daily practice and performance. We recently encountered a college-level flute student with marked hypermobility leading to technical difficulties in her musical repertoire. A therapeutic program consisting of education, adaptive devices, and an exercise program significantly decreased her extreme passive range of motion, thus improving her technique and allowing her to progress in her music studies despite her inherent hypermobility.

Case Description

A 19-year-old white, female flute major presented with problems secondary to hypermobile joints. She first began playing the flute at age five and had known for several years that she had "double joints." During her primary school years she had altered her finger positions and technique to make allowance for hyperextensive metacarpophalangeal (MCP) joints, but had not noticed problems until entering college where her music repertoire included music of more rapid tempo and difficult fingering. Hyperextensibility in the small joints of her hands led to air gaps in several stops and pain the fingers of the right hand and extensor and flexor tendon compartments of the left hand.

She described occasional spontaneous dislocation of her temporomandibular (TM) joints but denied problems with her elbows, shoulders, hips, knees, or feet. Her family history

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was negative for symptomatology suggestive of Marfan's syndrome, homocystinuria, Ehlers-Danlos, or other forms of hypermobility. She gave no history of excessive bruising, poor healing of scars, hyperelastic skin, or previous cardiac conditions. She had had no previous medical problems and was taking no medications.

Physical examination revealed normal height, weight, and arm span. Skin examination showed no evidence for hyperextensibility or poor wound healing, and cardiac examination revealed no murmurs, clicks, or rubs. Changes of hypermobility were limited to the wrist, fingers, and toes. The range of motion of the involved joints is shown in Figure 1. Her hands showed no evidence for arachnodactyly.

Examination while playing the flute revealed several modifications of technique to compensate for hypermobility. Her left thumb touched the flute stop with the ulnar aspect of the thumb rather than the pulp of the finger; this change caused discomfort along the abductor pollicis longus tendon while playing (Fig. 2A). The external rotation of the thumb resulted in 70° extension of the second MCP while playing. This abnormal position of the MCP caused an increased tightening

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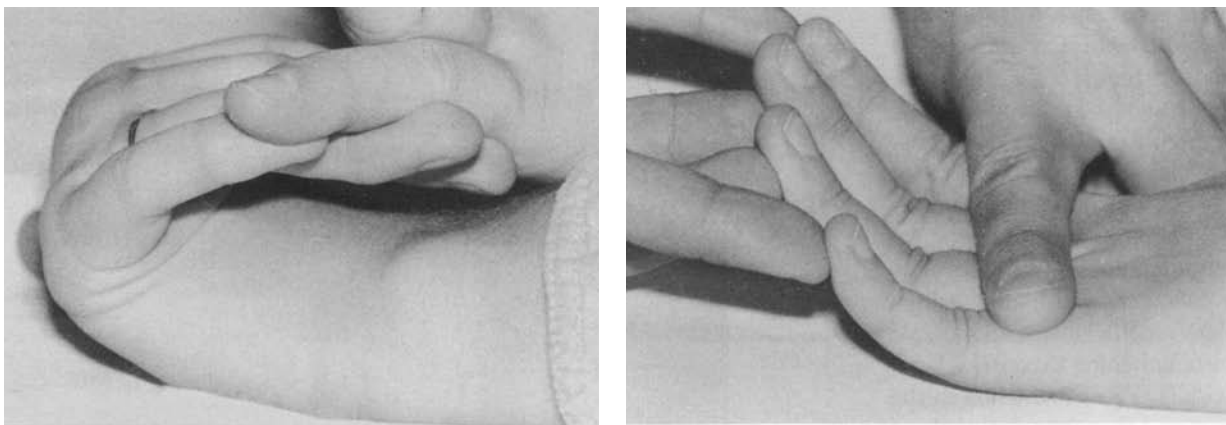


FIGURE 1 Marked hyperextensibility of the small joints of hands.

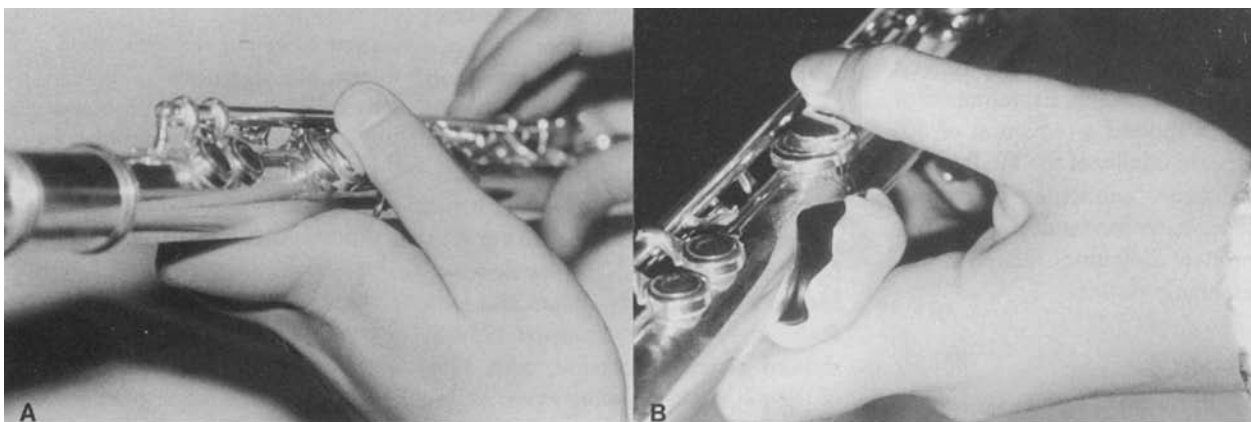
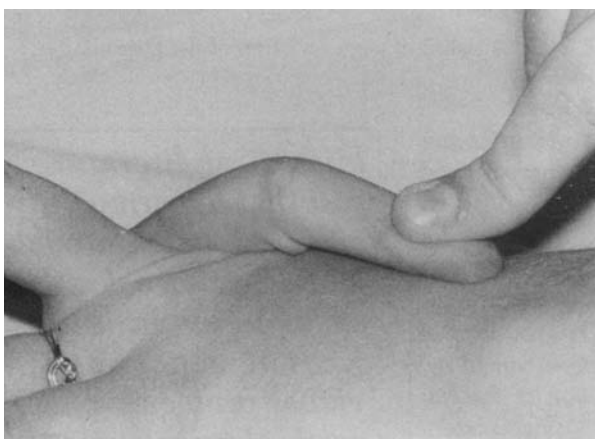


FIGURE 2 A, Hypermobility resulting in a 70° extension of the 2nd MCP joint while playing with contact between the thumb and the flute stop via the medial aspect of the digit rather than the pulp of the thumb. B, Correction of MCP hyperextension and abnormal thumb contact with use of a saddle splint.

of the flexor tendons over the radial aspect of the wrist and discomfort after playing even brief passages of moderately difficult music. A saddle splint had corrected the hyperextension to approximately 30°, but did not reduce the discomfort on the tendons of her thumb. Alternate thumb fingering of the left hand was nearly impossible to perform secondary to the pressure being

transmitted by the medial aspect of the thumb rather than the pulp of the finger. Examination of the second through fifth fingers while playing revealed a 30° hyperextensibility of the distal interphalangeal (DIP) joints with the wrist in the neutral position but no hyperextension of the DIP joints with the wrist extended to 30°. Examination of the right hand revealed no problems

with slow to moderate passages but 30° hyperextensibility of the DIP joints during rapid passages leading to air leakage through stop holes. Three stops of her flute had been artificially filled to lessen leakage during rapid passages.

Her therapeutic regimen included education about hypermobility syndrome, reassurance, an occupational therapy program to strengthen the flexor

apparatus of both hands, a dorsal trough splint to protect the DIP joint of the fourth and fifth fingers of the right hand, and an adaptive bridge for the flute so as to attempt a reduction in the hyperextensibility of the second MCP joint of the left hand. The strengthening program consisted of a therapeutic exercise regimen including composite flexion exercises, and individualized profundus, superficialis, and intrinsic muscle strengthening exercises. A polyform saddle (Fig. 3) attached to the flute decreased the extension angle of the second MCP joint from 30° to neutral position (Fig. 2B). Dorsal blocking splints for the DIP and PIP joints of both fifth digits lessened the tendency for hyperextensibility of the DIP joints during rapid passages.

After eight weeks of daily exercise therapy, the patient reported a moderate decrease in hyperextensibility of the MCP and DIP joints, increased ease and comfort in playing rapid passages, decreased tenderness and pain along the abductor pollicis longus of the right hand, and decreased incidence of air leakage through stop holes during rapid passages. Neither the extensor splint of the fifth finger of the right hand nor the saddle over the flute compromised her playing technique. Examination of her hands showed a reduction of 30° in hyperextensibility of the MCP joints, no evidence of tenderness or pain in the flexor-extensor tendon apparatus, and no new difficulties related to use of therapeutic devices.

Discussion

Within the past 20 years, interest in hypermobility syndrome has expanded from classic literature of Marfan's syndrome and Ehlers-Danlos to monographs¹ and articles describing problems related to benign hypermobility.^{2,3} Populations studied have included athletes,⁴ dancers,⁵ and music students,⁶ but few articles have addressed individual musician's problems caused by joint hypermobility.

Hypermobility of joints may be found in several systemic conditions, including Marfan's syndrome, Ehlers-Danlos syndrome, acromegaly, rheumatic fever, hyperparathyroidism, chronic al-

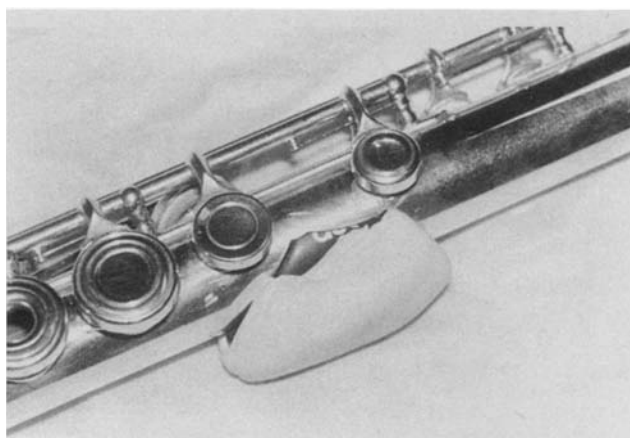


FIGURE 3 Saddle splint in place on barrel of the flute.

cohol abuse, rheumatoid arthritis, systemic lupus erythematosus, and pregnancy.¹ Patients with benign hypermobility show no evidence for systemic disorders but exhibit hypermobility characterized by a combination of: increased passive opposition of the thumb to the flexor surface of the arm; passive hypertension of the fingers (as shown in Fig. 1); hyperextensibility of the elbow beyond 10°; hyperextension of the knee beyond 10°; and an excessive range of passive flexion and eversion of the foot.

Benign hypermobility, affecting up to 10% of the general population, may be found in a higher prevalence in performing artists, especially musicians. Brandfonbrener, in a study of 43 string players and 32 pianists presenting with hand pain, found a 30% prevalence of benign hypermobility. Baum and Larsen's study at the Eastman School showed a similar increase, with 19% of their students showing evidence for hypermobility syndrome.^{7,8} Benjjani et al. found no increase in their population, but their small control group with a 20% prevalence of hypermobility makes for difficult comparison.⁹

Historical literature suggest that hypermobility has affected past musicians, with Paganini being the best example, but little has been written concerning individual problems related to particular instruments. One study examined the problems of a guitarist with hypermobility, but other data can only be inferred from the text of general articles. We believe our pa-

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tient to be the first described in detail with the diagnosis of benign hypermobility leading to problems playing the flute. Previous articles have described myalgis, TMJ syndrome, nerve entrapments, and thoracic outlet syndrome, thought to be related to or caused by flute playing, but none of these patients showed evidence of hypermobility.¹¹⁻¹⁵

We were encouraged by the rehabilitative treatment plan for our patient. Oftentimes, the physician's attitude is negative, and the patient is advised to discontinue a particular job or skill if musculoskeletal problems result from "abnormal activities," when, in fact, a combined rehabilitative plan of education, adaptive mechanical devices, and physical/occupational therapy can result in a return to the "prohibited" activity. A simple bridge to the barrel of our patient's flute, reassurance as to the benign nature of the problem, comfortable finger-splints, and a graduated exercise program resulted in noticeable im-

provement from both a musical and medical point of view.

We are, however, concerned that this student's problem could have been addressed at a much earlier age, which might have allowed more rapid musical advancement. She herself recognized that she was "double jointed" at an early age, and adaptive changes at that time may have kept her from learning incorrect fingering patterns. Music instructors should be taught to recognize problems such as hypermobility in their students, especially when studies suggest a high prevalence in the performing artist population. Only then with the help of physicians and therapists interested in problems of performing artists will teachers be able to maximize the talents of affected students.

We are planning such a curriculum at East Carolina University and hope to report its impact in the future.

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