

Fibrillation of the articular cartilages of the human sternoclavicular joint: a report of 20 autopsy cases

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Fibrillation of the articular cartilages of the human sternoclavicular joint. a report of 20 autopsy cases

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KEY WORDS

human sternoclavicular joint, osteoarthritis, articular cartilage, fibrillation histopathology

Introduction

Recently, the patients who suffer from the osteoarthritis (OA) increase, with rapid progression of longevity. The pain of the joint progresses rapidly from their forties, and they are prominent especially in the women. The pain of the joint gets behind in the daily life, and causes a big trouble for QOL¹⁻³⁾. There are articular capsule, articular cartilage, and synovial membrane as main components of the synovial joint. Nobody feels pain in the cartilage itself because a vessel and a nerve do not exist in the articular cartilage. However the damage of the cartilage proceeds, pain appears in the surrounding of the joint and synovial membrane⁴⁾.

It is well known that articular surfaces of human synovial joints are mostly formed by hyaline cartilage. As exceptions to this, surfaces of the sternoclavicular joint (SCJ), acromioclavicular joint and temporomandibular joint are described to be of dense fibrocartilage⁵⁾. But histological details of the human SCJ are still unclear⁶⁻⁹⁾. To our best knowledge, there is no histopathological report about the OA changes of the SCJ. The cartilage fibrillation appears in all joints suffered from OA¹⁻³⁾. The aim of this study is to evaluate OA changes, especially the degree of cartilage fibrillation of the human SCJ.

Materials and Methods

Human SCJs were collected from twenty autopsy

cases, carried out from April 2000 to July 2001, at Kanazawa university graduate school of medicine. Ante-mortem diagnosis of the musculoskeletal disease containing OA was not given in every case. There were 11 males and 9 females and the age ranged from 17 to 88 yr (mean \pm SD : 65.1 \pm 17.9). Clinical features of the 20 cases containing age, sex, main disease, and cause of death are summarized in Table. 1. In each case, SCJ was selected at random from either the left or the right one, and obtained in the routine autopsy technique of thoracotomy. The specimens were fixed in 10% neutral buffered formalin, decalcified in the Plank-Rychlo's solution for 1 day, then cut and sampled from coronal plane of the SCJs and embedded in paraffin. Sections of 3 μ m thicknesses were cut from each paraffin block, and were stained with hematoxylin and eosin.

Results

There were forty articular cartilages available because SCJ had the sternal and clavicular surfaces in each. Semi-quantitative analysis was done histologically about the degree of cartilage fibrillation. In 11 cartilages (clavicular surface of case 2, 5, 6, 8, 14, 19, 20 and sternal surface of case 6, 11, 18, 20), most on the surface of cartilage showed apparent fibrillation. In 16 cartilages (clavicular surface of case 10, 12, 15, 16, 17, 18 and sternal surface of case 1, 7, 8, 9, 10, 14, 15, 16, 17, 19), a part on the surface

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Table 1. Clinical Summary of 20 Cases Used in this Study

Case No.	Sampling		Main Disease	Cause of Death	
	Age	Sex			Side
1	67	F	R	SLE	MOF
2	83	M	L	DIC	SL
3	17	M	R	Myelodysplastic Syndromes	Sepsis
4	40	F	L	AML	Pneumonia
5	81	F	L	Mitral Regurgitation	Pneumonia
6	88	F	R	Myocardial Infarction	SL
7	74	F	R	Acute Cardiac Failure	Cardiac Failure
8	76	M	R	Myocardial Infarction	Cardiac Failure
9	66	M	L	Angiosarcoma of Heart	SL
10	81	F	L	Dissecting Aneurysm	SL
11	73	F	R	Infectious Peritonitis	SL
12	58	M	L	Liver cirrhosis	Liver Failure
13	75	M	L	Gastric Carcinoma	Renal Failure
14	49	M	R	Vasculitis Syndrome	unknown
15	71	M	L	Lung Carcinoma	SL
16	58	M	L	Hepatocellular Carcinoma	Liver Failure
17	54	M	R	Hepatocellular Carcinoma	Liver Failure
18	39	F	L	CML	MOF
19	78	F	L	Liver Failure	Liver Failure
20	73	M	R	Carcinomatous Meningitis	SL

M, Male; F, Female; L, Left; R, Right; SL, Same as in the Left
 MOF, Multiple Organ Failure; CML, Chronic Myeloid Leukemia
 SLE, Systemic Lupus Erythematosus; AML, Acute Myeloid Leukemia
 DIC, Disseminated Intravascular Coagulation

Table 2. Semi-quantitative analysis of the 40 Articular Surfaces

Case No.	Clavicular Surface	Sternal Surface
1	-	+
2	++	-
3	-	-
4	-	-
5	++	-
6	++	++
7	-	+
8	++	+
9	-	+
10	+	+
11	-	++
12	+	-
13	-	-
14	++	+
15	+	+
16	+	+
17	+	+
18	+	++
19	++	+
20	++	++

++, fibrillation is apparent in most on the surface of cartilage
 +, fibrillation is observed in a part on the surface of cartilage
 -, none

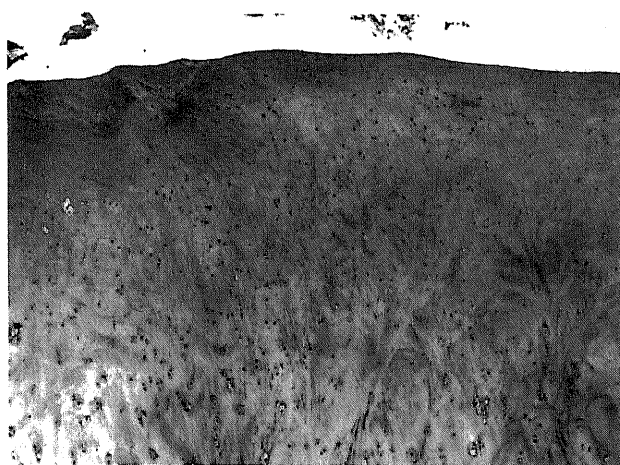


Fig. 1. The example of an articular cartilage of the SCJ without fibrillation.

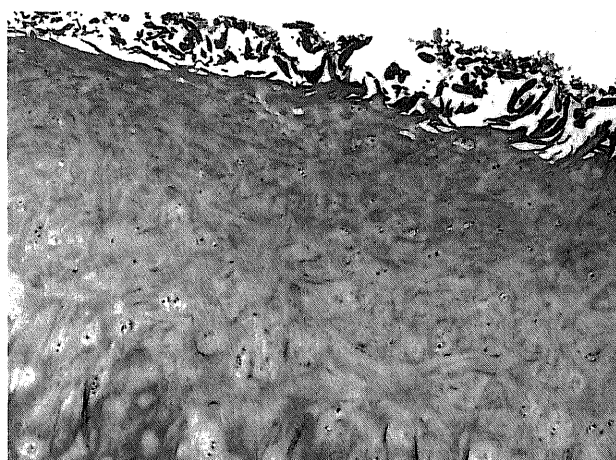


Fig. 2. The example of an articular cartilage of the SCJ with apparent fibrillation.

of the cartilage showed fibrillation. And in the residual 13 cartilages (clavicular surface of case 1, 3, 4, 7, 9, 11, 13 and sternal surface of case 2, 3, 4, 5, 12, 13), apparent fibrillation was not shown (Table. 2). There was no significant difference though the degree of fibrillation showed a tendency to become worse with age.

Discussion

OA is one of the most common and disabling disorders in the general population. It is a slowly progressive disease, characterized morphologically by destruction of cartilage, formation of bone cysts, sclerosis of subchondral bone and presence of osteophytes at the joint margin. Histologically, OA is characterized by significant changes in the composition of cartilage. The earliest structural change in OA is fibrillation at the articular surface¹¹⁾. It is possible that OA attacks the joint of the whole body, and that the cartilage fibrillation appears in all joints suffered from OA¹⁻³⁾. We deduced that the SCJ is not an exception to it. The results described above support our expectations, though all cases used in this study had no ante-mortem diagnosis of the musculoskeletal disease including OA. It may indicate that the human SCJs are involved frequently in OA without clinical signs, or symptoms of their OA are pretermitted.

As far as we know, this is the first histopathological description of cartilage fibrillation of the human SCJ.

References

- 1) Lawrence, R.C., Hochberg, M.C., Kelsey, J.L., et. al. : Estimates of the prevalence of selected arthritic and musculoskeletal diseases in the United States. *J Rheumatol*, 16 : 427-441, 1989
- 2) Davis, M.A., Ettinger, W.H., Neuhaus, J.M., et. al. : Knee osteoarthritis and physical functioning : evidence from the NHANES I Epidemiologic Followup Study. *J Rheumatol* 18 : 591-598, 1991
- 3) Shiozaki, H., Koga, Y., Omori, G., et. al. : Epidemiology of osteoarthritis of the knee in a rural Japanese population. *The Knee*, 6(3) : 183-188, 1999
- 4) Gray, H., Bannister, L.H., Berry, M.M., et. al. (eds) : *Gray's Anatomy : The Anatomical Basis of Medicine and Surgery*. 38th ed., 495-498, Churchill Livingstone, Edinburgh, 1995
- 5) Gray, H., Bannister, L.H., Berry, M.M., et. al. (eds) : *Gray's Anatomy : The Anatomical Basis of Medicine and Surgery*. 38th ed., 443-452, Churchill Livingstone, Edinburgh, 1995
- 6) Ellis, E. 3d., Carlson, D.S. : Histologic comparison of the costochondral, sternoclavicular, and temporomandibular joints during growth in *Macaca mulatta*. *J. Oral Maxillofac. Surg.*, 44 : 312-321, 1986
- 7) Langen, P. : Untersuchungen über die altersveränderungen und abnutzungserscheinungen am sternoclaviculargelenk. *Virchows Arch. Path. Anat.*, 293 : 381-408, 1934
- 8) Sokoloff, L., and Gleason, I.O. : The sternoclavicular articulation in rheumatic disease. *Am. J. Clin. Path.*, 24 : 406-414, 1954
- 9) Berthelot, J.M., Mabile, A., Nomballais, M.F., Maugars, Y., Robert, R., Prost, A. : Ostitis condensans of the clavicle : Does fibrocartilage play a role? *Rev Rhum Engl Ed.*, 62 : 501-506, 1995
- 10) Hosono, M., Kanemori, Y., Inoue, S., et. al. : The Articular

Cartilages of the Human Sternoclavicular Joints are not only formed by a Fibrocartilage but a Hyaline Cartilage or Combination of Both Cartilage Tissue Types ; A Histological Study of 7 Japanese Autopsy Cases. *Memoirs Health Sci. Med. Kanazawa Univ.*, 24(1) : 15-20, 2000

11) Kumar, V., Cotran, R. S., Robbins, S.L. (eds) : *Robbins Basic Pathology* 7th ed., 772-773, Saunders, Philadelphia, 2003

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