

文 献 (筋音図)

作成 : 三田勝己 (mitak@inst-hsc.pref.aichi.jp) 2001. 7.

1665

(***印は総説)

Grimaldi FM: Physco-mathesis de Lumine, Coloribus et Iride. (1665)

1810

Wollaston WH: On the duration of muscular action. Philos Trans R Soc London: 1-5 (1810)

1885

Herroun EF, Yeo GF: Note on the sound accompanying the single contraction of skeletal muscle. J Physiol 6: 287-292 (1885)

1886

Schafer EA, Canney HEL, Tunstall JO: On the rhythm of muscular response to volitional impulses in man. J Physiol 7: 111-117 (1886)

1948

Gordon G, Holbourn AHS: The sounds from single motor units in a contracting muscle. J Physiol 107: 456-464 (1948)

1973

Cerquiglioni S, Figura F, Marchetti M, Salleo A: Evaluation of athletic fitness in weight-lifters through biomechanical, bioelectrical and bioacoustical data. Biomechanics III: pp189-195 (1973)

1974

Marchetti M, Salleo A, Figura F, Del Gaudio V: Electromyographical and phonomyographical patterns in muscle atrophy in man. Biomechanics IV: vol 1, pp388-393 (1974)

1976

Lammert O, Jorgensen F, Einer-Jensen N: Accelerometermyography (AMG) I. method for measuring mechanical vibrations from isometrically contracted muscles. Biomechanics V-A: pp152-158 (1976)

Jorgensen F, Lammert O: Accelerometermyography (AMG) II. contribution of motor unit. Biomechanics V-A: pp159-164 (1976)

1980

Oster G, Jaffe JS: Low frequency sounds from sustained contraction of human skeletal muscle. Biophys J 30: 119-128 (1980)

1983

Brozovich FV, Pollack GH: Muscle contraction generates discrete sound bursts. *Biophys J* 41: 35-40 (1983)

1984

Oster G: Muscle sounds. *Sci Am* 250: 80-88 (1984)***

1985

Barry DT, Geiringer SR, Ball RD: Acoustic myography : a noninvasive monitor of motor unit fatigue. *Muscle Nerve* 8: 189-194 (1985)

Hufschmidt A: Acoustic phenomena in the latent period of skeletal muscle : a simple method for in-vivo measurement of the electro-mechanic latency (EML). *Pflugers Arch* 404: 162-164 (1985)

1986

Barry DT, Leonard JA Jr, Gitter AJ, Ball RD: Acoustic myography as a control signal for an externally powered prosthesis. *Arch Phys Med Rehabil* 67: 267-269 (1986)

Rhatigan BA, Mylrea KC, Lonsdale E, Stern LZ: Investigation of sounds produced by healthy and diseased human muscular contraction. *IEEE Trans Biomed Eng* 33: 967-971 (1986)

1987

Barry DT: Acoustic signals from frog skeletal muscle. *Biophys J* 51: 769-773 (1987)

Frangioni JV, Kwan-Gett TS, Dobrunz LE, McMahon TA: The mechanism of low frequency sound production in muscle. *Biophys J* 51: 775-783 (1987)

Hufschmidt A, Schubnell P, Schwaller I: Assessment of denervation by recording of muscle sound following direct stimulation. *Electromyogr clin Neurophysiol* 27: 301-304 (1987)

1988

Barry DT, Cole NM: Fluid mechanics of muscle vibrations. *Biophys J* 53: 899-905 (1988)

Diemont B, Figini MM, Orizio C, Perini R, Veicsteinas A: Spectral analysis of muscular sound at low and high contraction level. *Int J Biomed Comput* 23: 161-175 (1988)

Stokes IAF, Moffroid MS, Rush S, Haugh LD: Comparison of acoustic and electrical signals from erector spinae muscles. *Muscle Nerve* 11: 331-336 (1988)

1989

Accornero N, Berardelli A, Manfredi M: A composite probe for acoustic and electromyography recording of muscular activity. *Electroenceph clin Neurophysiol* 72: 548-549 (1989)

Bolton CF, Parkes A, Thompson TR, Clark MR, Sterne CJ: Recording sound from human skeletal muscle : technical and physiological aspects. *Muscle Nerve* 12: 126-134 (1989)

Keidel M, Keidel WD: The computer-vibrography as a biometric process in studying muscle function. *Biomed Technik* 34: 107-116 (1989)

Orizio C, Perini R, Veicsteinas A: Muscular sound and force relationship during isometric contraction in man. *Eur J Appl Physiol* 58: 528-533 (1989a)

Orizio C, Perini R, Veicsteinas A: Changes of muscular sound during sustained isometric contraction up to exhaustion. *J Appl Physiol* 66: 1593-1598 (1989b)

Wee AS, Ashley RA: Vibrations and sounds produced by sustained voluntary muscle contraction. *Electromyogr clin Neurophysiol* 29: 333-337 (1989)

1990

Barry DT, Gordon KE, Hinton GG: Acoustic and surface EMG diagnosis of pediatric muscle disease. *Muscle Nerve* 13: 286-290 (1990a)

Barry DT, Cole NM: Muscle sounds are emitted at the resonant frequencies of skeletal muscle. *IEEE Trans Biomed Eng* 37: 525-531 (1990b)

Barry DT: Acoustic signals from skeletal muscle. *NIPS* 5: 17-21 (1990c)***

Dobrunz LE, Pelletier DG, McMahon TA: Muscle stiffness measured under conditions simulating natural sound production. *Biophys J* 58: 557-565 (1990)

Maton B, Petitjean M, Cnockaert JC: Phonomyogram and electromyogram relationships with isometric force reinvestigated in man. *Eur J Appl Physiol* 60: 194-201 (1990)

Orizio C, Perini R, Diemont B, Figini MM, Veicsteinas A: Spectral analysis of muscular sound during isometric contraction of biceps brachii. *J Appl Physiol* 68: 508-512 (1990)

Wee AS, Ashley RA: Transmission of acoustic or vibratory signals from a contracting muscle to relatively distant tissues. *Electromyogr clin Neurophysiol* 30: 303-306 (1990)

1991

Barry DT: Muscle sounds from evoked twitches in the hand. *Arch Phys Med Rehabil* 72: 573-575 (1991)

Dalton PA, Stokes MJ: Acoustic myography reflects force changes during dynamic concentric and eccentric contractions of the human biceps brachii muscle. *Eur J Appl Physiol* 63: 412-416 (1991)

Goldenberg MS, John Yack J, Cerny FJ, Burton HW: Acoustic myography as an indicator of force during sustained contractions of small hand muscle. *J Appl Physiol* 70: 87-91 (1991)

Stokes MJ, Dalton PA: Acoustic myography for investigating human skeletal muscle fatigue. *J Appl Physiol* 71: 1422-1426 (1991a)

Stokes MJ, Dalton PA: Acoustic myographic activity increases linearly up to maximal voluntary isometric force in the human quadriceps muscle. *J Neurol Sci* 101: 163-167 (1991b)

Zwarts MJ, Keidel M: Relationship between electrical and vibratory output of muscle during voluntary contraction and fatigue. *Muscle Nerve* 14: 756-761 (1991)

1992

Barry DT: Vibrations and sounds from evoked muscle twitches. *Electromyogr clin Neurophysiol* 32: 35-40 (1992a)

Barry DT, Hill T, Im D: Muscle fatigue measured with evoked muscle vibrations. *Muscle Nerve* 15: 303-309 (1992b)

Lee DJ, Stokes MJ, Taylor RJ, Cooper RG: Electro and acoustic myography for noninvasive assessment of lumbar paraspinal muscle function. *Eur J Appl Physiol* 64: 199-203 (1992a)

Lee DJ, Stokes MJ: Repeatability of electro- and acoustic myographic activity during a fatigue test of normal lumbar paraspinal muscles. *Clin Rehabil* 6: 265-273 (1992b)

Marchetti M, Felici F, Bernardi M, Minasi P, Di Filippo L: Can evoked phonomyography be used to recognize fast and slow muscle in man? *Int J Sports Med* 13: 65-68 (1992)

Orizio C, Perini R, Diemont B, Veicsteinas A: Muscle sound and electromyogram spectrum analysis during exhausting contractions in man. *Eur J Appl Physiol* 65: 1-7 (1992a)

Orizio C: Soundmyogram and EMG cross-spectrum during exhausting isometric contractions in humans. *J Electromyograph Kinesiol* 2: 141-149 (1992b)

Orizio C, Veicsteinas A: Soundmyogram analysis during sustained maximal voluntary contraction in sprinters and long distance runners. *Int J Sports Med* 13: 594-599 (1992c)

Petitjean M, Maton B, Cnockaert JC: Evaluation of human dynamic contraction by phonomyography. *J Appl Physiol* 73: 2567-2573 (1992)

Stokes MJ, Cooper RG: Muscle sounds during voluntary and stimulated contractions of the human adductor pollicis muscle. *J Appl Physiol* 72: 1908-1913 (1992)

Wright F, Stokes MJ: Symmetry of electro- and acoustic myographic activity of the lumbar paraspinal muscles in normal adults. *Scand J Rehab Med* 24: 127-131 (1992)

Zhang YT, Frank CB, Rangayan RM, Bell GD: A comparative study of simultaneous vibromyography and electromyography with active human quadriceps. *IEEE Trans Biomed Eng* 39: 1045-1052 (1992)

1993

Dalton PA, Stokes MJ: Frequency of acoustic myography during isometric contraction of fresh and fatigued muscle and during dynamic contraction. *Muscle Nerve* 16: 255-261 (1993)

L'Estrange P, Rowell J, Stokes MJ: Acoustic myography in the assessment of human masseter muscle. *J Oral Rehab* 20: 353-362 (1993)

Orizio C: Muscle sound : bases for the introduction of a mechanomyographic signal in muscle studies. *Crit Rev Biomed Eng* 21: 201-243 (1993a)***

Orizio C, Solomonow M, Baratta RV, Veicsteinas A: Influence of motor units recruitment and firing rate on the soundmyogram and EMG characteristics in cat gastrocnemius. *J Electromyograph Kinesiol* 2: 232-241 (1993b)

Rodriquez AA, Agre JC, Knudtson ER, Franke TM, Ng AV: Acoustic myography compared to electromyography during isometric fatigue and recovery. *Muscle Nerve* 16: 188-192 (1993)

Smith TG, Stokes MJ: Technical aspects of acoustic myography (AMG) of human muscle : contact pressure and force/AMG relationship. *J Neurosci Methods* 47: 85-92 (1993)

Stokes MJ: Acoustic myography : applications and considerations in measuring muscle performance. *Isokinetics and Exercise Science* 3: 4-15 (1993)***

1994

Cole NM, Barry DT: Muscle sound frequencies of the frog are modulated by skeletal muscle tension. *Biophys J* 66: 1104-1114 (1994)

Herzog W, Zhang Y-T, Vaz M, Guimaraes ACS, Janssen C: Assessment of muscular fatigue using vibromyography. *Muscle Nerve* 17: 1156-1161 (1994)

Orizio C, Esposito F, Veicsteinas A: Effect of acclimatization to high altitude (5,050m) on motor unit activation pattern and muscle performance. *J Appl Physiol* 77: 2840-2844 (1994)

Petitjean M, Bellemare F: Phonomyogram of the diaphragm during unilateral and bilateral phrenic nerve stimulation and changes with fatigue. *Muscle Nerve* 17: 1201-1209 (1994)

1995

Petitjean M, Maton B: Phonomyogram from single motor units during voluntary isometric contraction. *Eur J Appl Physiol* 71: 215-222 (1995)

1996

Akasaki K, Mita K, Itoh K, Suzuki N, Watakabe M: Acoustic and electrical activities during voluntary isometric contraction of biceps brachii muscles in patients with spastic cerebral palsy. *Muscle Nerve* 19: 1252-1257 (1996)

Esposito F, Malgrati D, Veicsteinas A, Orizio C: Time and frequency domain analysis of electromyogram and sound myogram in the elderly. *Eur J Appl Physiol* 73: 503-510 (1996)

Orizio C, Liberati D, Locatelli C, De Grandis D, Veicsteinas A: Surface mechanomyogram reflects muscle fibres twitches summation. *J Biomechanics* 29: 475-481 (1996)

Rodriguez AA, Agre JC, Franke TM, Swiggum ER, Curt JT: Acoustic myography during isometric fatigue in postpolio and control subjects. *Muscle Nerve* 19: 384-387 (1996)

Vaz MA, Herzog W, Zhang Y-T, Leonard TR, Nguyen H: Mechanism of electrically elicited muscle vibrations in the in situ cat soleus muscle. *Muscle Nerve* 19: 774-776 (1996)

Vaz MA, Zhang Y-T, Herzog W, Guimaraes ACS, MacIntosh BR: The behavior of rectus femoris and vastus lateralis during fatigue and recovery: an electromyographic and vibromyographic study. *Electromyogr clin Neurophysiol* 36: 221-230 (1996)

Wood JC, Barry DT: Time-frequency analysis of skeletal muscle and cardiac vibrations. *Proc IEEE* 84: 1281-1294 (1996)***

Zhang Y-T, Frank CB, Rangayyan RM, Bell GD: Relationship of the vibromyogram to the surface electromyogram of the human rectus femoris muscle during voluntary isometric contraction. *J Rehabil Res & Develop* 4: 395-403 (1996)

1997

Brown P: Muscle sounds in Parkinson's disease. *Lancet* 349: 533-535 (1997)

Chen D, Durand L-G, Lee HC, Petitjean M, Bellemare F: Time-frequency analysis of the muscle sound of the human diaphragm. *Med Biol Eng Comput* 35: 649-652 (1997a)

Chen D, Durand L.-G., Bellemare F: Time and frequency domain analysis of acoustic signals from a human muscle. *Muscle Nerve* 20: 991-1001 (1997b)

Evetovich TK, Housh TJ, Stout JR, Johnson GO, Smith DB, Ebersole KT: Mechano-myographic responses to concentric isokinetic muscle contractions. *Eur J Appl Physiol* 75: 166-169 (1997)

Matheson GO, Maffey-Ward L, Mooney M, Ladly K, Fung T, Zhang Y-T: Vibromyography as a quantitative measure of muscle force production. *Scand J Rehab Med* 29: 29-35 (1997)

Orizio C, Esposito F, Sansone V, Parrinello G, Meola G, Veicsteinas A: Muscle surface mechanical and electrical activities in myotonic dystrophy. *Electromyogr clin Neurophysiol* 37: 231-239 (1997)

Smith DB, Housh TJ, Stout JR, Johnson GO, Evetovich TK, Ebersole KT: Mechano-myographic responses to maximal eccentric isokinetic muscle actions. *J Appl Physiol* 82: 1003-1007 (1997)

Shinohara M, Kouzaki M, Yoshihisa T, Fukunaga T: Mechanomyography of the human quadriceps muscle during incremental cycle ergometry. *Eur J Appl Physiol* 76: 314-319 (1997)

Stout JR, Housh TJ, Johnson GO, Evetovich TK, Smith DB: Mechanomyography and oxygen consumption during incremental cycle ergometry. *Eur J Appl Physiol* 76: 363-367 (1997)

Vaz MA, Herzog W, Zhang Y-T, Leonard TR, Nguyen H: The effect of muscle length on electrically elicited muscle vibrations in the situ cat soleus muscle. *J Electromyograph Kinesiol* 7: 113-121 (1997)

1998

Akasaki K, Mita K, Itoh Y: Repeatability of mechanomyogram (MMG) from voluntary isometric contraction of biceps brachii muscles. *Jpn J Phys Fitness Sports Med* 47: 489-498 (1998)

Courteville A, Gharbi T, Cornu J-Y: MMG measurement: a high-sensitivity microphone-based sensor for clinical use. *IEEE Trans Biomed Eng* 45: 145-150 (1998)

Celichowski K, Grottel K, Bichler E: Relationship between mechanomyogram signals and changes in force of human forefinger flexor muscles during voluntary contraction. *Eur J Appl Physiol* 78: 283-288 (1998)

Ebersole KT, Housh TJ, Johnson GO, Evetovich KT, Smith DB, Perry SR: The effect of leg flexion on the mechanomyographic responses to isometric muscle action. *Eur J Appl Physiol* 78: 264-269 (1998)

Esposito F, Orizio C, Veicsteinas A: Electromyogram and mechanomyogram changes in fresh and fatigued muscle during sustained contraction in men. *Eur J Appl Physiol* 78: 494-501 (1998)

Evetovich TK, Housh TJ, Johnson GO, Smith DB, Ebersole KT, Perry SR: Gender comparisons of the mechanomyographic responses to maximal concentric and eccentric isokinetic muscle actions. *Med Sci Sports Exerc* 30: 1697-1702 (1998)

Shinohra M, Kouzaki M, Yoshihisa T, Fukunaga T: Mechanomyogram from the different heads of the quadriceps muscle during incremental knee extension. *Eur J Appl Physiol* 78: 289-295 (1998)

Smith DB, Housh TJ, Johnson GO, Evetovich TK, Ebersole KT, Perry SR: Mechanomyographic and electromyographic responses to eccentric and concentric isokinetic muscle actions of the biceps brachii. *Muscle Nerve* 21: 1438-1444 (1998)

Watakabe M, Itoh Y, Mita K, Akataki K: Technical aspects of mechanomyography recording with piezoelectric contact sensor. *Med Biol Eng Comput* 36: 557-561 (1998)

1999

Akataki K, Mita K, Itoh Y: Repeatability study of mechanomyography in submaximal isometric contractions using coefficient of variation and intraclass correlation coefficient. *Electromyogr Clin Neurophysiol* 39: 161-166 (1999a)

Akataki K, Mita K, Itoh Y: Relationship between mechanomyogram and force during voluntary contractions reinvestigated using spectral decomposition. *Eur J Appl Physiol* 80: 173-179 (1999b)

Ebersole KT, Housh TJ, Johnson GO, Evetovich TK, Smith DB, Perry SR: MMG and EMG responses of the superficial quadriceps femoris muscles. *J Electromyograph Kinesiol* 9: 219-227 (1999)

Evetovich TK, Housh TJ, Weir JP, Johnson GO, Smith DB, Ebersole KT: Mean power frequency and amplitude of the mechanomyographic signal during maximal eccentric isokinetic muscle actions. *Electromyogr Clin Neurophysiol* 39: 123-127 (1999)

Kouzaki M, Shinohra M, Fukunaga T: Non-uniform mechanical activity of quadriceps muscle during fatigue by repeated maximal voluntary contraction in humans. *Eur J Appl Physiol* 80: 9-15 (1999)

Orizio C, Baratta RV, Zhou BH, Solomonow M, Veicsteinas A: Force and surface mechanomyogram relationship in cat gastrocnemius. *J Electromyograph Kinesiol* 9: 131-140 (1999a)

Orizio C, Diemont B, Esposito F, Alfonsi E, Parrinello G, Moglia A, Veicsteinas A: Surface mechanomyogram reflects the changes in the mechanical properties of muscle at fatigue. *Eur J Appl Physiol* 80: 276-284 (1999b)

Ouamer M, Boiteux M, Petitjean M, Travens L, Sales A: Acoustic myography during voluntary isometric contraction reveals non-propagative lateral vibration. *J Biomechanics* 32: 1279-1285 (1999)

Yoshitake Y, Moritani T: Force and surface mechanomyogram relationship in cat gastrocnemius. *J Electromyograph Kinesiol* 9: 209-217 (1999)

2000

Bichler E: Mechanomyograms recorded during evoked contractions of single motor units in the rat medial gastrocnemius muscle. *Eur J Appl Physiol* 83: 310-319 (2000)

Nonaka H, Mita K, Akataki K, Watakabe M, Yabe K: Mechanomyographic investigation of muscle contractile properties in preadolescent boys. *Electromyogr clin Neurophysiol* 40: 287-293 (2000)

Orizio C, Baratta RV, He Zhou B, Solomonow M, Veicsteinas A: Force and surface mechanomyogram frequency responses in cat gastrocnemius. *J Biomechanics* 33: 427-433 (2000)

Weir JP, Ayers KM, Lacefield JF, Walsh KL: Mechanomyographic and electromyographic responses during fatigue in humans: influence of muscle length. *Eur J Appl Physiol* 81: 352-359 (2000)

2001

Akataki K, Mita K, Watakabe M, Itoh K: Mechanomyogram and force relationship during voluntary isometric ramp contractions of the biceps brachii muscle. *Eur J Appl Physiol* 84: 19-25 (2001)

Madeleine P, Bajaj P, Sogaard K, Arendt-Nielsen L: Mechanomyography and electromyography force relationships during concentric, isometric and eccentric contractions. *J Electromyograph Kinesiol* 11: 113-121 (2001)

Watakabe M, Mita K, Akataki K, Itoh Y: Mechanical behavior of condenser microphone in mechanomyography. *Med Biol Eng Comput* 39: 195-201 (2001)

Yoshitake Y, Miyazaki M, Moritani T: Assessment of low-back muscle fatigue using electromyography, mechanomyography, and near-infrared spectroscopy. *Eur J Appl Physiol* 84: 174-179 (2001)

- 赤滝久美, 伊藤晋彦, 三田勝己, 鈴木伸治, 渡壁 誠, 加藤厚生: Muscular Soundを用いた脳性麻痺患者の筋機能の分析. **医用電子と生体工学** 30: 200-207 (1992)
- 赤滝久美, 伊藤晋彦, 三田勝己, 鈴木伸治, 渡壁 誠, 高橋由美, 伊東保志: 筋電図と筋音を用いた脳性麻痺患者の筋機能の分析. **リハ医学** 31: 551-554 (1994)
- 赤滝久美, 三田勝己: 筋音による筋収縮過程の推定. **医用電子と生体工学 BME** 8: 30-38 (1994)***
- 伊東保志, 赤滝久美, 伊藤晋彦, 三田勝己: 筋音を用いた持続性筋収縮過程の分析. **疲労と休養の科学** 10: 75-81 (1995)
- 伊東保志, 赤滝久美, 三田勝己: 疲労に至る持続性筋収縮における筋活動様式の変化 - 筋音図法による解析 - . **人間工学** 33: 175-181 (1997)
- 久野弘明, 三田勝己, 渡壁 誠, 赤滝久美, 伊藤正美: 筋電図および筋音図のフラクタル解析. **電気学会論文誌** 119-C: 261-268 (1999)
- 伊東保志, 赤滝久美, 三田勝己: 筋音図のスペクトル解析 - 筋線維長軸短縮成分の除去 - . **電子情報通信学会** J82-D-2: 1210-1216 (1999)
- 伊東保志, 渡壁 誠, 赤滝久美, 三田勝己: 筋音図計測に用いるトランスデューサの物理的特性. **電子情報通信学会** J84-D-2: 408-416 (2001)
- 三田勝己: 筋音図. 宮村 (編) 新運動生理学上巻. **真興交易** (2001印刷中)***