臨 床

Significance of the Referred Spasms of the Abdominal Wall Muscles during Visceral Pain

by

KAORU KUMADA, KENGO TSUNEKAWA and AKIRA MACHIZUKA

From the 2nd Surgical Division, Kyoto University Medical School
(Director : Prof. Dr. CHUJI KIMURA)

Received for Publication Sep. 6, 1966

Painful disorders in the abdominal organs provoke the referred spasms in abdominal muscles, mainly M. rectus abdominis.

We observed in 7 patients during laparatomy how the referred spasm participated in the appearance of the abdominal pain.

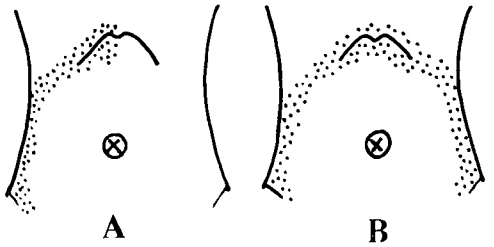

Fig. 1. Areas of the abdominal wall nerve block.

METHOD

Seven cases in the table were laparatomied in the orthodox incisions with local anesthesia.

Painful complaints produced with local injection of 2.5% acetylcholine in the intestinal wall or traction of the mesenterium and others were observed.

And then, the abdominal walls were anesthetized in the ways illustrated in the figure 1 (A or B). It was observed beside the previous what complaints were produced with the same stimulations.

One per sent xylocaine was used in all cases. Some were premedicated with Opystan (pethidine). All seemed to be rid of an excess of fear before operation by elucidation of pain and others.

RESULTS

Results were summarized in the table 1.

Acetylcholine injection or the traction produced nausea, uncomfortable feeling beyond comparison and pain in the epigastrium, near the navel or the whole abdomen.

After the hemilateral anesthesia, all complaints seemed to be lightened and pain was lateralized in the opposite side. In the cases of the bilateral anesthesia, local signs of pain disappeared and other complaints diminished.

The same stimulation produced various intensities of pain according to the case. Premedication or elucidation on pain for conciliation of the patients no doubt lightened the complaint.

Table 1. 7 cases of gastrointestinal operation with abdominal somatic nerve block

Anaesthesia & Operation	Traction	Application of Ach
block B with Opystan Laparatomy with median incision	These procedures to gastric wall cause only traction sensation without localisation, nausea and fear.	
block B with Opystan Appendectomy	Traction sensation with slight pain in upper median No nausea	Traction sensation in upper median
block A with Opystan Appendectomy	Traction sensation with slight pain in l-epigastrium Nausea	
block B Appendectomy	Traction sensation with slight pain in l-epigastrium	
block A Appendectomy	L-epigastralgia Vomiting	Traction sensation with slight l-epigastralgia
block B r-hernioplasty	Traction of net causes no complaint	
block A Appendectomy	L-epigastralgia with nausea and fear	

COMMENTS

There is no harmless method for producing of visceral pain but the intestinal stimulation (or gastric) with acetylcholine injection or traction.

So, here is observed a character of mesenteric sensation as an example of visceral sensation.

KIMURA C. pointed out the importance of visceral sensation in abdominal pain.

SETO H. suggested that there were the receptors of abdominal pain in the abdominal wall and DAVIS L. & L. J. POLLACK said the original visceral sensation was referred to the abdominal wall, from where abdominal pain ascended centrally. However, the referred spasms of the abdominal muscles have been usually considered only as a local sign of visceral pain.

Our experiment showed, the abdominal pain caused from the intestinal (or gastric) stimulation consisted of the original visceral sensation and the referred spasms. The referred spasm, that is to say, modified the nature and the intensity of the original visceral sensation and gave the local sign.

It is suggested the referred spasms in the abdominal wall muscles give painful characters, local signs, nausea and others, to the original visceral sensation—— uncomforts beyond comparison, fear and traction sensation.

SUMMARY

With 7 patients laparatomied under local anesthesia, it was observed how the abdominal wall nerve block transfigured complaints produced with acetylcholine injection into

the intsstinal (or gastric) wall or traction of the organs.

Hemilateral abdominal wall nerve block brought lateralisation of pain in the opposite side and lightened all complaints.

Bilateral block brought uncomfortable feeling beyond description or traction sensation without local sign, not painful complaints.

It is considered visceral pain consisted of original visceral sensation producing uncomforts, fear and traction sensation, and of the refered spasms in the abdominal muslces producing so called pain, local sign and perhaps participating in vomiting.

(Presented before at the Symposium on Pain of the 24th Annual Meeting of the Japan Neurosurgical Society, Tokyo, 1965.)

REFERRENCES

1) Kimura C. : Recent progress in clinical medicine. Vol. 7. Nagai shoten, Osaka, 1954. (in Japanese)
2) Davis L. and Pollack L. J. : The peripheral pathway for painful sensations. Arch. Neurol. & Psych. **24** : 883-898, 1930.
3) Davis L., Pollack L. J. and Stone T. T. : Visceral pain. Surg. Gyn. & Obst. **55** : 418-426, 1932.
4) Seto H. : Studies on the Sensory Innervation (human sensibility). Igaku-shoin, Tokyo, 1963.
5) Tsunekawa K. : Electromyographic studies on the visceromotor reflexes. Arch. Jap. Chir. **28** : 2949-2963, 1959.

和文抄録

腹痛における腹筋の関連痙攣の意義

京都大学医学部外科第二講座（指導：木村忠司教授）

熊田 馨・恒川謙吾・町塚 昭

虫垂切除術・試験開腹術・鼠蹊ヘルニア形成術の7例について，局所麻酔下に開腹が行われ，胃腸等の牽引，2.5%アセチールコリン胃腸管漿膜下注入による腹痛が観察された．次いで，右腹壁神経遮断・両側同遮断後の同様刺激による愁訴の変化が観察された．

右側遮断によつては，愁訴は若干減弱し，痛み等は左側に限局し，両側遮断によれば痛みは名状し難い不快感・牽引感にかわりいづれも部位感が消失する．更に両側遮断では悪心嘔吐がみとめ難い．

これによつて腸管疝痛などの腹痛は部位感のない不快・牽引感をもたらす内臓知覚と，体性知覚に顕著な痛み，悪心・嘔吐・部位感などをもたらす腹筋関連痙攣との合成された感覚であることがうかがわれる．