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Indication for the Lumbosacral or Upper Lumbar Sympatico-Ganglionectomy

by

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Received for Publication Nov. 16, 1968

In 1913 Leriche originated the denervation of sympathetic nerves that supply the arteries, that is, periarterial sympathectomy, for the treatment of circulatory and painful disorders in the extremities. However, it was not until 1925 that the surgery of the sympathetic nervous system had abruptly come to the fore and made rapid advancement.

Stimulated by my confirmation of the favorable effect of the Leriche's operation, I had extended this to lumbosacral sympatico-ganglionectomy for the treatment of spontaneous gangrene in 1925.

The progress of the development of the surgery of the sympathetic nervous system is shown on table 1. The operation dates back to the observation of Dr. Royle in 1924. He noted improved circulation in the leg of patients following lumbar ramisectomy for spastic paralysis. Quite independently of his report, I had performed the transabdominal lumbosacral sympatico-ganglionectomy for two cases of spontaneous gangrene. Two months later, practically identical operation had been reported by Adson and Brown, and half a year later by Diez. Subsequently, I had been performing this operation extra-abdominally, and extended the indication for this operation technique to include the functional deficiency, dyskinesia colica, and have further improved the clinical effect of the operation by additional upper sympathectomy.

Table 1

Name of Reporter	Kind of the disease operated	Date of Publication
Royle	Spastic paralysis	1924
Ohsawa	Spontaneous gangrene	April, 1925
Adson and Brown	Raynaud's disease	June, 1925
Diez	Spontaneous gangrene	October, 1925
Davis and Kanavel	Raynaud's disease	1926
Leriche and Fontaine	Raynaud's disease	1933
Flothow, P. G.	Op. method	1935
Smithwick	Raynaud's disease	1936
Pearl F. L.	Op. method	1937
Atlas L. N.	Raynaud's disease	1940

Presented at XVI. Biennial International Congress, Tokyo, Kyoto, October 4-11, 1968.

The purpose of the present paper is to describe the indication for the lumbosacral and upper lumbar sympatigo-ganglionectomy on the basis of the experience with more than thousand patients and of the systematic studies for the past 41 years.

VASCULAR DISEASES AND PAINFUL DISORDERS OF THE EXTREMITIES

From 1925 to 1940, at Kyoto Imperial University, the lumbosacral sympathico-ganglionectomy was applied on various kinds of diseases shown in the Table 2, with apparently curative effect or symptomatic improvement. After 1941, at Dairen Hospital and at my private clinic hospital in Kyoto, 104 cases were operated.

Table 2 Clinical Results of lumbosacral Sympathico-Ganglionectomy
(Date of case reports, for the years 1923 to 1939 at Kyoto University)

Case diagnosis	patient	more effective	effective	slightly effective	ineffective (amputated)
Raynaud's disease	6	6			
Spontaneous gangrene (lower extremity)	171	84 (49.12%)	68 (39.76%)	19 (11.11%)	28 (16.37%)
ditto (upper extremity)	32	13	16	3	
Syphilitic gangrene	2		1	1	1
Diabetic gangrene	2		1	1	1
Thrombangitic gangrene	1			1	1
Traumatic gangrene	1				
Frostbitic gangrene	1	1			
Leprous gangrene	1				
Erythromeralgia	4		2	2	
Tropic leg ulcer	1	1			
Chronic leg ulcer	7	7			
Varicose ulcer	3	3			
Chronic suppurative Osteomyelitis	13	13			
Tuberculosis of bone and joint	2	1		1	
Elephantiasis	3	1			
Ischias	3		2	2	
Tabetic leg pain	1		1		
Causalgia	1		1		
Chronic rheumatic gonitis	1				

The summary of the clinical effects of 326 cases of operation upon the circulatory function of extremities shows that 167 cases (51.3%) were markedly improved 122 cases (32.4%) showed moderate improvement, and the operation brought some benefit in 88.7% in total. (table 3).

Whether the above stated improvement is permanent or not is difficult to determine at present, however, a 63 year old woman operated on for spontaneous gangrene in May 1925 and passed her 43rd postoperative years and is still enjoying good health, and another case of a man aged 82 years, now has been living 41 years in good health after the operation in 1927.

Table 3 Clinical effects of Lumbosacral or lumbar Sympathico-Ganglionectomy upon Raynaud's Disease, Spontaneous Gangrene, and other Circulatory Diseases of the extremities

	No. of cases	more effective	effective	slightly effective	Amputation
at Kyoto University surgery	222	106	88	28	32
Dairen Hospital surgery	58	31	20	7	7
Ohsawa Hospital surgery	46	30	14	2	2
total	326	167	122	37	41
%		51.27%	37.42%	1.13%	1.25%

FUNCTIONAL DISORDERS OF LARGE INTESTINE

Upper lumbar sympathico-ganglionectomy was applied on many cases of functional disorders of large intestine such as habitual constipation and chronic diarrhea. Table 4 shows the results of the operation which was reported at Japan Surgical Society Meeting of 1943.

Table 4 Upper lumbar Sympathico-Ganglionectomy (bilaterally operated) delivered at Japan Surgical society, April 1943

type of constipation	No. of cases	satisfactory result	improved	no benefit
severe constipation	42	35	6	1
pain accompanying constipation	15	15	0	0
diarrheal type	7	7	0	0
total	64	57	6	1

In 1944, the upper lumbar sympathico-ganglionectomy and additional resection of ganglion coeliacum were performed on 41 cases with decided improvement in the clinical symptoms. Summary figure of effectiveness of the operation ranged between 75 and 77% of operated cases.

As shown in table 5, 582 cases were treated by these operations in Dairen Hospital

Table 5 The results of upper lumbar Sympathico-ganglionectomy for colon dyskinesia in Dairen Hospital (Ohsawa surgical service)

No. of cases and result type of abnormal defecation	total	effective	slightly effective	ineffective
severe constipation (over one week)	178	59	15	4
slight constipation (within several days)	217	156	49	12
difficult defecation (scanty stool)	95	77	16	2
diarrheal type (habitual diarrhea intermittent diarrhea and constipation)	66	56	14	4
constipation accompanied by pain	84	72	8	6
constipation accompanied by distension	42	28	8	2
total	582	442 (75.77%)	110	30

and percentage of patients cured or markedly improved numbered 442 cases, constituting 75.8% of all cases treated.

Of 140 cases operated on at my clinic hospital, from 1951 to 1966, practically all cases were unilaterally operated (table 6), and 90 cases (64.3%) were markedly benefited. This result shows a less effectiveness as compared with the clinical improvement given in table 5. It is considered that the bilateral operation is more effective than the unilateral method, and furthermore, it may indicate that the effect of this operation is probably due to the removal of hyperactive automatic nerves that supply the diseased organs or tissues.

Table 6 The results of upper lumbar Sympathico-Ganglionectomy (unilaterally operated) for colon dyskinesia in Ohsawa surgical Hospital 1951-1966

No. of cases	total	effective	slightly effective	ineffective
type of abdominal defecation				
severe constipation (over one week)	34	21	10	2
slight constipation (within several days)	50	31	15	4
difficult defecation (scanty stool)	12	8	23	1
diarrheal type (one intermittent diarrheal and constipation)	21	15	5	1
constipation accompanied by pain	16	10	4	2
constipation accompanied by distension	71	5	4	2
total	140	90 (64.28%)	38	12

DUMPING SYNDROME

Question of postgastrectomy complication of dumping syndrome being due to the balance of autonomic nervous control induced us to expect a possible effect of the operation on 8 patients, but we have failed to obtain any definite answer from our experiences.

Table 7 Case Report on upper lumbar sympathico-Ganglionectomy for Dumping Syndrome

name	age	sex	Original illness	Operation tecnic of gastrectomy	time of apperrance of Dumping	Symptoms	extent of ganglion- ectomy	Outcome after guaglionectomy
Ohe	♂	55	Gastric ulcer	BII	one year post gastrectomy	abdominal dystension, diarrhed, lassitued, emaciation	L1-2-3	satisfactory result
I	♂	26	Gastroptosis	BII	one year post gastrectomy	abdominal dystension, nausea, anorexia, anemia, compression on the chest, emaciation	L1-2	good (but transient)
Nishi	♂	27	Gastric ulcer	BII	three years post gastrectomy	compression in epigastrium, anorexia, sweating, anemia emaciation, palpitation	L1-2-3	satisfactory result
Yama	♂	28	Gastric ulcer	BII	two years post gastrectomy	constiption, diarrhea, nausea, insomnia shoulder stiffness anorexia, inability to eat	L1-2	satisfactory result

Tsuru	♂	19	Gastric ulcer	BII	three years post gastrectomy	anorexia, general faiigue emaciation	L1-2-3	good (but transient)
Numa	♂	49	Gastric ulcer	BI	three months post gastrectomy	epigastralgia, anemia anorexia lassitude feneral fatigue	L1-2	satisfactory result
Shige	♂	41	Gastric ulcer	BI	six months post gastrectomy	lower abdominal distension, anemia, lassitude, general factigue	L1-2	good (but transient)
Mori	♂	20	Gastritis	BI	one year post gastrectomy	compression in epigastrium, inability to eat, insommia compression on the chest.	L1-2	good (but transient)

COMPLICATION

The total number of lumbosacral or lumbar sympathico-ganglionectomy (bilaterally or unilaterally) increased to 1089 up to date (table 8). The operation has been found to be free from danger to life and free from any postoperative symptom beyond a few days of discomfort. In only one patient postoperative erythromelalgic symptoms occurred but these have spontaneously disappered in one or two years without treatment. In a single patient there occurred a short incidence of impotency that cleared up in a few weeks.

Table 8 Lumbosacral or lumbar Sympathico-Ganglionectomy

	Gangrene	others	Colon dyskinesia	Dumping	
at Kyoto University	222	33			
at Dairen Hospital	58		582		
at Ohsawa Hospital	46		140	8	
total	326	33	722	8	1089

CONCLUSIONS

1. The lumbosacral or upper lumbar sympathico-ganglionectomy is most effective for the treatment of spontaneous gangrene, Raynaud's disease and the functional disturbances of large intestines.
2. So far as the diseases of the functional disorders of the intestines are concerned, the bilateral operations are more effective than the unilateral one, and even in patients having symptoms of circular disturbance chiefly on one side of the extremities bilateral sympathectomy seemed to be more beneficial.
3. The diseases above mentioned may be closely related to the autonomic nerves that supply the diseased organs or tissues. Therefor, more might be expected from this surgery, if the patients are treated with this operation as early as possible at the stage in which clinical symptoms can never be improved by an internal treatment.
4. The effect of this surgery is probably due to the removal of the hyperactive autonomic nerves that supply the diseased organs or tissues, because the hyperfunction of the autonomic nerves may disturb the automaty of the organs or tissues.

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和文抄録

腰薦或は上腰交感神経節状索切除術の適応症

大沢外科病院 (院長: 大沢 達)

大 沢 達

私は1925年1月京都大学外科学教室に於て、下肢の特発脱疽に対して腹腔から本手術を実施し、その手術結果を1925年4月第26回日本外科学会に於て、患者を供覧して発表したのであるが、この報告例が下肢血行障害性疾患に施こされた最初の手術例と信ずるのである。私は後になつて文献調査により、奇しくも類似の報告例が同年6月 Adson により、又同年10月に Diez により報告されていることを知り、又1924年に Royle により Spastic Paralysis に対して本手術が行なわれていることを見出したが、私の報告例は Royle, Adson, Diez 等とは何等関係なく全く independent に行なわれたのであつた。

而して1928年以降私は本手術を腹膜外から行なつており、1940年以降適応症を更に拡大して胃下垂、結腸機能不全症 Dyskinesia colica に進め、神経節切除範囲を上腰部交感神経節 (L₁₋₂) とし効果を挙げている。これ等の症例は1940年以降10年間大連病院大沢外科臨床に於て施行され、且つ胃結腸蠕動等のレントゲンの、或は実験的検索も併せ行なわれたのであつたが、1951年以降大沢外科病院でも引き続き多数手術例を追加施行し、1966年までに総計症例1089例に達した。

1089例中結腸機能不全症は722例であるが、大連病院例は全部両側に切除が行なわれており、その総計数は582例でこの中442例が有効例 (75.7%) であり、大沢外科病院例140例は全部片側切除であつたが、うち90例の有効例 (64.28%) であつて、この結果から明ら

かに両側切除が片側切除より優つていることが立証され、且つ効果永続性であつた。

本手術の本命と考えられるレーノー氏病、特発脱疽等の四肢血行障害性疾患の手術例は、京都大学222例、大連病院58例、大沢外科病院46例、計326例の成績は167例 (51.27%) の奏効、122例 (37.42%) の有効、総計88.69% の優秀な成績を示し、この場合に於ても両側切除例の方が優つており然も永続的であつた。本手術効果の持続性に就いては、私の京大時代の症例、女、Raynaud's disease 現在63才は1925年5月 Lumbosacrale Ganglionectomy 施行後43年を経過し、また特発脱疽症例、男、現在82才は1927年手術後41年を経過し、いずれも再発の徴全くなき、術後も持続的に不変の温感を手術側肢に維持している事実が、良く手術効果の永続性を証明している。

本手術は極めて安全な手術であつて、1925年の第1例以来今日まで1例の死亡例なく、また術後の不快感状として特に数えあげる程の何もなく、僅かに数例に坐骨神経痛様症状を訴えた者のあつたこと、ただ1例ではあつたが Erythromelalgic 症状を1年余に亘つて訴えた者があつたが、いずれも対症治療で治癒し、また他の1例に術後2、3週間の短期間の Impotency の症状のあつた事を追憶するが、特別の治療を施すことなく治癒した。なお本手術の効果は発病新鮮なほど率が高いと思われる。Dumping Syndrome に対する本手術の成績は試みられた少数例では断定はむずかしい。