
GIST

Pre-Operative Treatment & Surgical Approaches

General Principles of GIST Surgery

Pre-Operative (Neoadjuvant) Therapy

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Disclosure

- Certis Oncology Solutions



Eilber

- UCLA GIST History
- General Principles of GIST Surgery
- Pre-Operative (Neoadjuvant) Therapy

Kadera

- Laparoscopic / Minimally Invasive GIST Surgery



UCLA GIST History

Eilber FC, Eilber FR, Rosen G, Forscher C. Surgical resection and adjuvant intraperitoneal chemotherapy for recurrent abdominal sarcomas. *Connective Tissue Oncology Society*. Milan, Italy, November 1997.

Annals of Surgical Oncology, 6(7):645-650
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Surgical Resection and Intraperitoneal Chemotherapy for Recurrent Abdominal Sarcomas

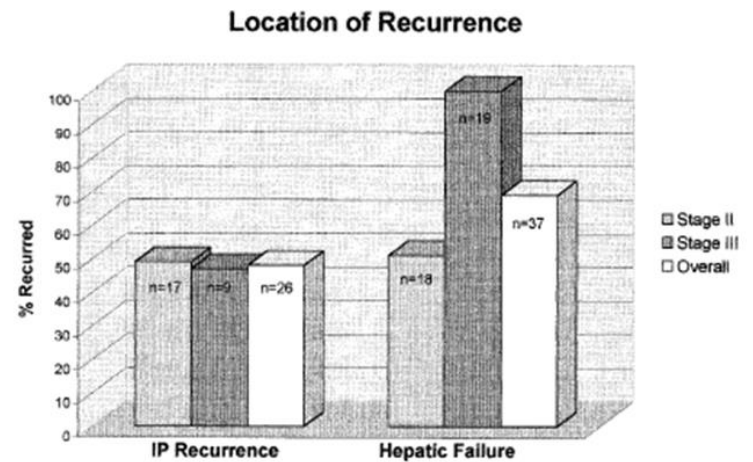
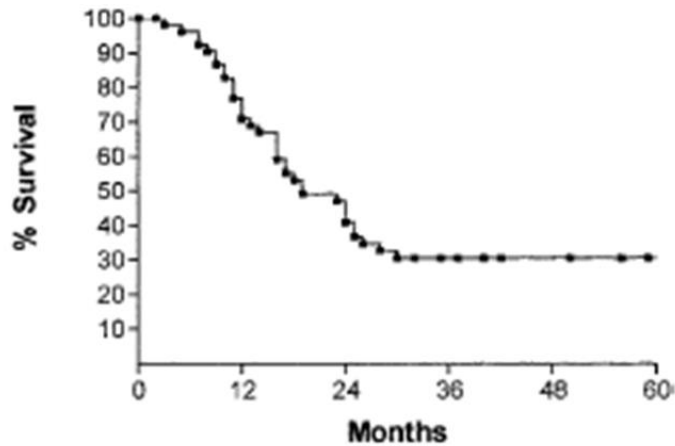
Fritz C. Eilber, MD, Gerald Rosen, MD, Charles Forscher, MD, Scott D. Nelson, MD,
Frederick J. Dorey, PhD, and Frederick R. Eilber, MD



UCLA GIST History

TABLE 2. *Histologic Subtypes*

	No.	(%)
GI stromal sarcoma	33	(61.0)
Uterine leiomyosarcoma	14	(25.9)
Liposarcoma	4	(7.4)
Hemangiosarcoma	1	(1.9)
Synovial cell sarcoma	1	(1.9)
Osteosarcoma	1	(1.9)
Total	54	100



GIST History

Editorial

Recurrent Visceral Sarcoma: New Paradigm for an Old Problem?

The lead authorship by Eilber, secundus, heralds a new level of parental success. Many of us are flattered and delighted when our trainees and young colleagues are willing to take on the clinical problems that beset us, and take great delight in knowing that the frustrations of our own inadequacies will be addressed by others more junior and often more capable than ourselves. However, to convince a member of one's family to follow, not only in medicine but also in surgery, the same discipline, and to have similar interests, is a feat matched by few. We should all feel quietly delighted and a little envious of the parental success of Eilber, primus.

Brennan, MF. Ann Surg Oncol. 6(7):627-8, 1999



GIST History

C-kit (CD117) and GIST

Gain-of-Function Mutations of *c-kit* in Human Gastrointestinal Stromal Tumors

Seiichi Hirota,* Koji Isozaki,* Yasuhiro Moriyama,
Koji Hashimoto, Toshirou Nishida, Shingo Ishiguro,
Kiyoshi Kawano, Masato Hanada, Akihiko Kurata,
Masashi Takeda, Ghulam Muhammad Tunio, Yuji Matsuzawa,
Yuzuru Kanakura, Yasuhisa Shinomura, Yukihiko Kitamura†

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Imatinib in GIST

Brief Report

EFFECT OF THE TYROSINE KINASE INHIBITOR STI571 IN A PATIENT WITH A METASTATIC GASTROINTESTINAL STROMAL TUMOR

HEIKKI JOENSUU, M.D., PETER J. ROBERTS, M.D.,
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DAVID TUVESON, M.D., PH.D.,
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RENAUD CAPDEVILLE, M.D., SASA DIMITRIJEVIC, PH.D.,
BRIAN DRUKER, M.D., AND GEORGE D. DEMETRI, M.D.

• N Engl J Med, Vol. 344, No. 14 • April 5, 2001

50-year-old woman

1996 – diagnosed with 10cm gastric GIST

Feb 1998 – resection of liver metastasis

Sep 1998 – resection of liver metastasis

*Nov 1998 – Mar 1999 – 7 cycles of ifosfamide, mesna,
doxorubicin, dacarbazine – no response*

Mar 1999 – resection of peritoneal metastasis

*Apr 1999 – Feb 2000 – thalidomide, interferon – no
response*

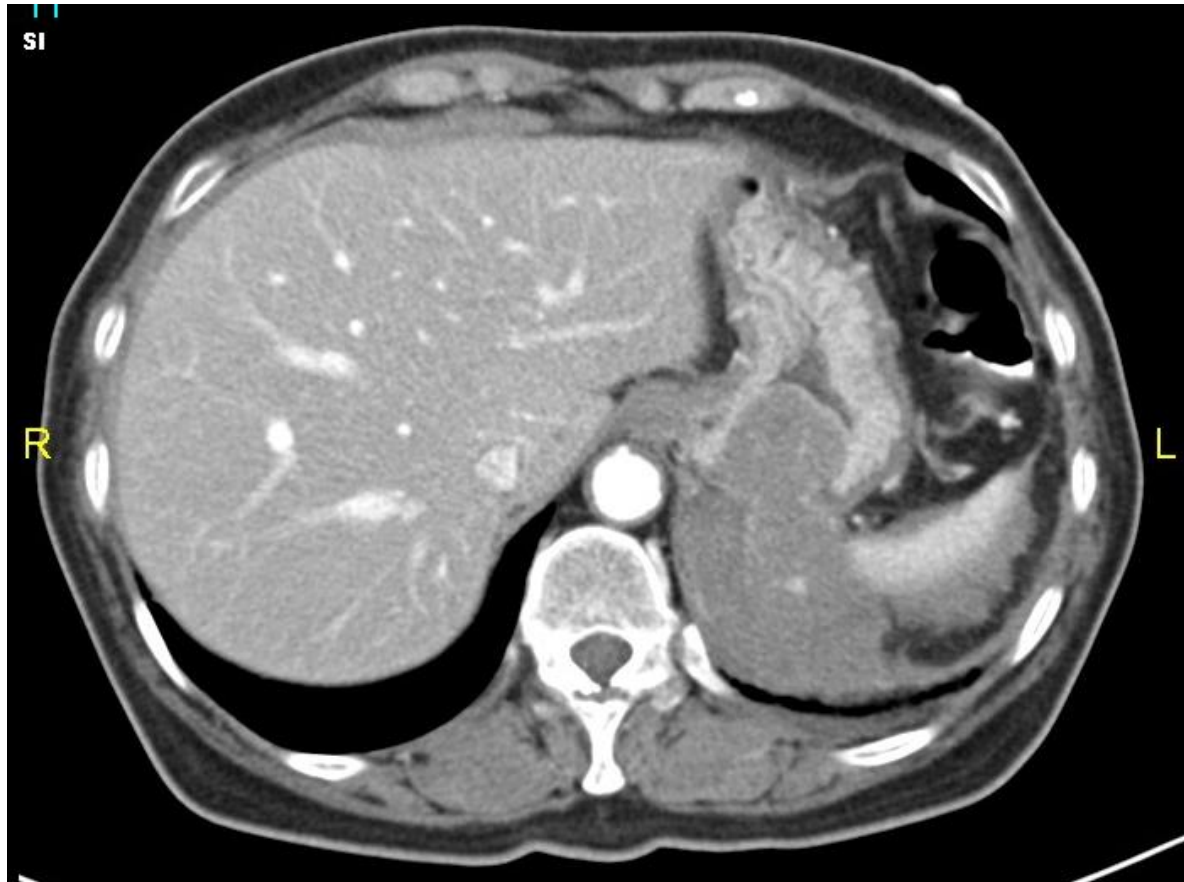
Mar 2000 – starts on imatinib 400mg daily



GIST Surgical Principles

- Pre-Operative Biopsy
 - Needle bx
 - Mutational analysis





GIST Surgical Principles

- Pre-Operative Biopsy
 - Needle bx
 - Mutational analysis
- Completely resect tumor
 - R0 Resection
 - Resection of this GI site of origin
 - Resection of adjacent involved organ
 - GIST usually push adjacent organs and not invade
 - Lymphadenectomy is basically never required



GIST Surgical Principles

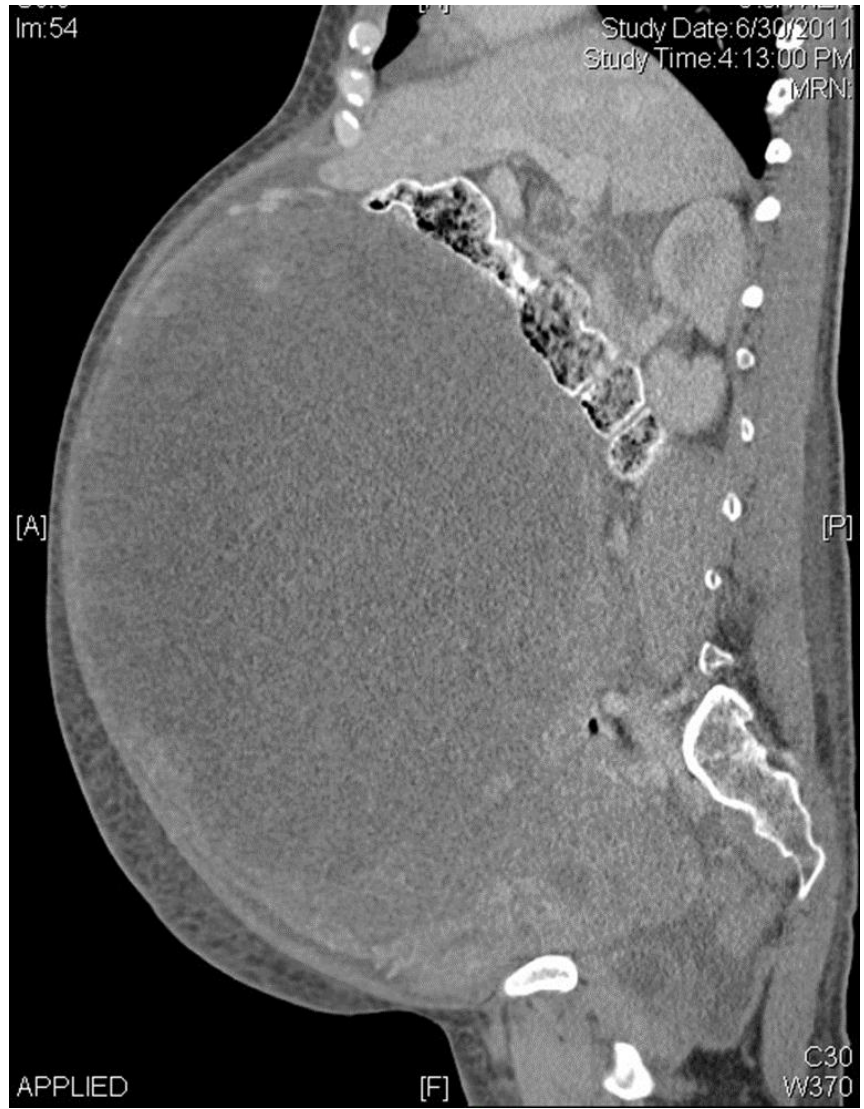
- Pre-Operative Biopsy
 - Needle bx
 - Mutational analysis
- Completely resect gross disease
 - resection of GI site of origin
 - Resection of adjacent involved organ
 - GIST usually push adjacent organs and not invade
 - lymphadenectomy is basically never required
- Avoid tumor rupture
- Assess for metastatic disease
- Surgical Oncologist Specializing in Sarcoma

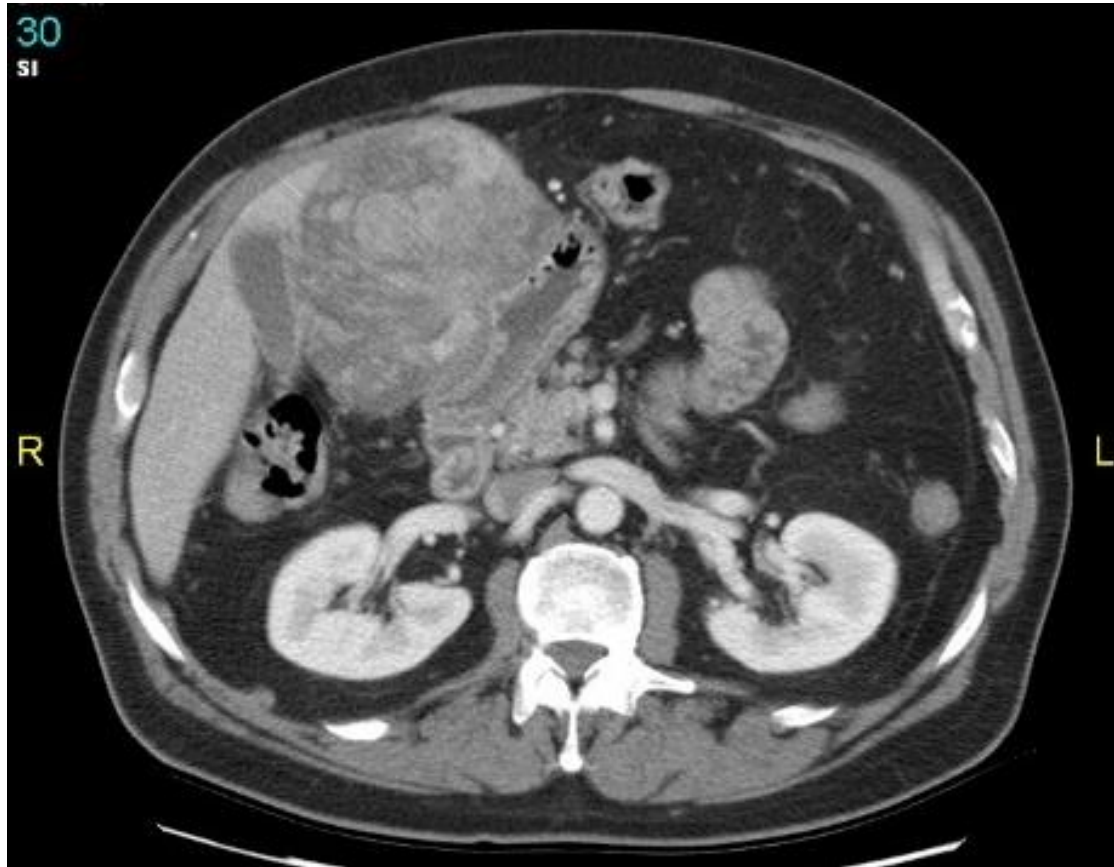


Neoadjuvant Imatinib for GIST

- Treat micro-metastatic disease at presentation
- Decrease size of tumor:
 - reduction in size can be dramatic
 - reduces need for adjacent organ resection
- Decrease morbidity of operation:
 - less blood loss
 - fragile/bloody tumor → firm/fibrotic/less vascular







Current Recommendation for Neoadjuvant imatinib GIST

- Unresectable or borderline resectable primary tumor
- Potentially-resectable tumor that may compromise adjacent organs
- Local recurrence of locally-advanced disease
- **Any high risk GIST that will be treated with adjuvant imatinib**

Phase II Trial of Neoadjuvant/adjuvant Imatinib Mesylate for Advanced Primary and Metastatic/recurrent Operable Gastrointestinal Stromal Tumors: Long-term Follow-up Results of Radiation Therapy Oncology Group 0132

Dian Wang, MD, PhD¹, Qiang Zhang, PhD², Charles D. Blanke, MD³, George D. Demetri, MD⁴, Michael C. Heinrich, MD⁵, James C. Watson, MD⁶, John P. Hoffman, MD⁶, Scott Okuno, MD⁷, John M. Kane, MD⁸, Margaret von Mehren, MD⁶, and Burton L. Eisenberg, MD⁹



Keywords: GIST; imatinib; neoadjuvant; preoperative; stomach; gastric

Phase II study of neoadjuvant imatinib in large gastrointestinal stromal tumours of the stomach

Yukinori Kurokawa^{*1}, Han-Kwang Yang^{*2}, Haruhiko Cho³, Min-Hee Ryu⁴, Toru Masuzawa⁵, Sook Ryun Park⁴, Sohei Matsumoto⁶, Hyuk-Joon Lee², Hiroshi Honda⁷, Oh Kyoung Kwon⁸, Takashi Ishikawa⁹, Kyung Hee Lee¹⁰, Kazuhito Nabeshima¹¹, Seong-Ho Kong², Toshio Shimokawa¹², Jeong-Hwan Yook¹³, Yuichiro Doki¹, Seock-Ah Im¹⁴, Seiichi Hirota¹⁵, Seokyung Hahn¹⁶, Toshirou Nishida¹⁷ and Yoon-Koo Kang⁴

Table 1. Baseline characteristics of patients in the full analysis set	
	(n = 53)
Country	
Japan	32 (60%)
Korea	21 (40%)
Age (years)	
Median	69
Range	43–79
IQR	62–73
Sex	
Male	24 (45%)
Female	29 (55%)
ECOG performance status	
0	28 (53%)
1	25 (47%)
Tumour size (cm)	
Median	12.0
Range	10.0–23.0
IQR	10.4–15.7
Sampling method used to obtain tumour tissue	
Endoscopic standard biopsy	24
EUS-FNA	28
Percutaneous biopsy	1
Genotyping	
<i>KIT</i> exon 11	47 (89%)
Wild-type <i>KIT</i> and <i>PDGFRA</i>	2 (4%)
Not available	4 (8%)
Abbreviations: IQR = interquartile range; ECOG = Eastern Cooperative Oncology Group; EUS-FNA = endoscopic ultrasound-guided fine-needle aspiration.	

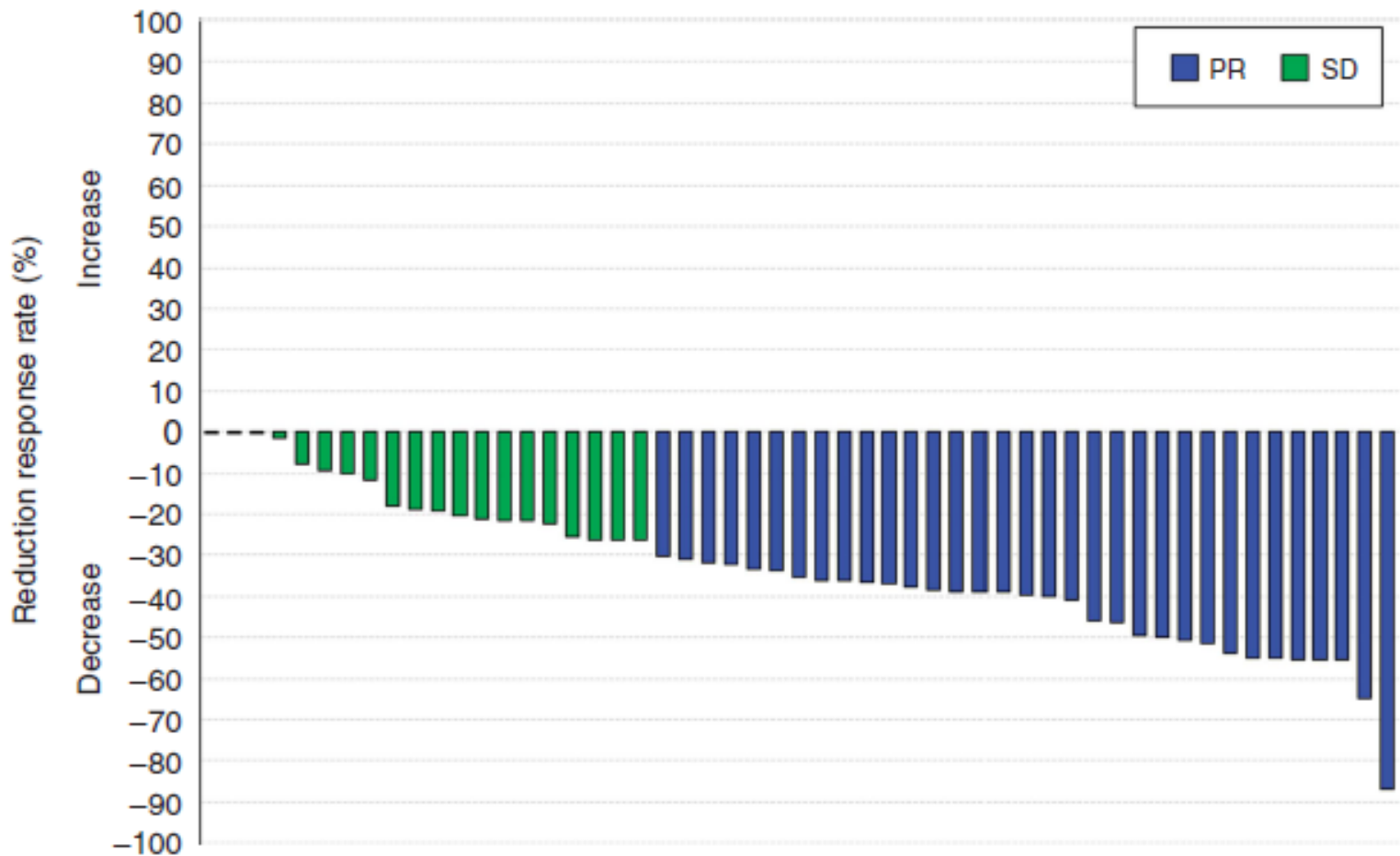
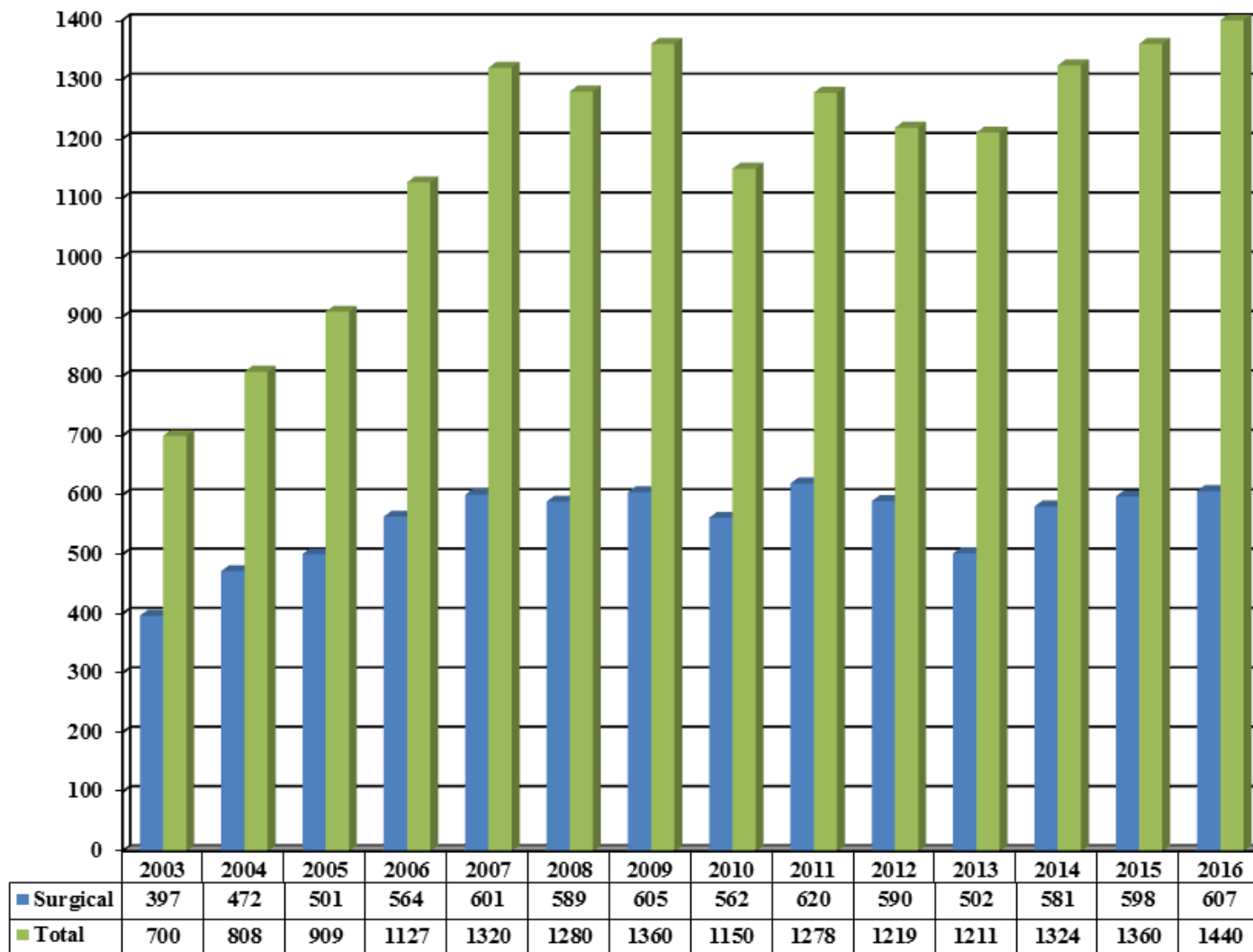


Table 3. Surgical and pathological findings	
	(n = 50)
Operation time (min)	
Median	150.5
Range	63–373
IQR	101–229.3
Blood loss (ml)	
Median	50
Range	Little – 2200
IQR	Little – 272.5
Type of gastrectomy	
Partial	42 (84%)
Proximal	5 (10%)
Total	3 (6%)
Combined resection of other organs (excluding the gallbladder)	
No	38 (76%)
Yes ^a	12 (24%)
Spleen	9
Distal pancreas	3
Transverse colon	2
Liver	2
Completeness of surgery	
R0	48 (96%)
R1	1 (2%)
R2	1 (2%)
Preservation of at least half of the stomach with R0 resection	
Yes	42 (84%)
No	8 (16%)
Tumour size (cm)	
Median	8.0
Range	4.7–20.0
IQR	7.5–11.8
Histologically confirmed metastasis	
None	47 (94%)
Peritoneum	3 (6%)
Mitotic count	
< 5/50 HPF	42 (84%)
5–9/50 HPF	3 (6%)
≥ 10/50 HPF	5 (10%)
Abbreviations: IQR = interquartile range; HPF = high-power field.	
^a Some cases were duplicated.	



UCLA Sarcoma Program Annual Volume



David Geffen
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UCLA Sarcoma Program GIST Experience

- 385 GISTs 1998 - 2018
- Neoadjuvant Imatinib High Risk Primary GISTs
 - 102 from 2001-2016
- One of the largest single institution experiences
 - Likely longest f/u time
- Duration of neoadjuvant therapy – 6 to 9 months



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