Laparoscopic assessment and resectability prediction in advanced stages

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Cytoreductive Surgery

Hoskins, (1994)

Fig. 2. Survival by residual disease, Gynecologic Oncology Group protocols (PR) 52 and 97.
New terminology for cytoreduction in advanced ovarian cancer

- **Complete resection** (no macroscopic disease)
- **Minimal residual** (macroscopic disease up to 1cm)
- **Gross residual** (macroscopic disease larger than 1 cm)

Zapardiel & Morrow
*Lancet*, 2011
During the platinum era, maximal cytoreduction was one of the most powerful determinants of cohort survival among patients with stage III or IV ovarian carcinoma.

Each 10\% decrease in residual tumor volume produced a 5.5\% increase in median survival.

Consistent referral of patients with apparent advanced ovarian cancer to expert centers for primary surgery may be the best means currently available for improving overall survival.

(Bristow et al., 2002)
Catholic University of the Sacred Heart

AOC: a 20 yrs experience (1988-2010)

N° of patients

Cytoreduction in advanced ovarian cancer

**Standard debulking (24%)**: extrafascial abdominal hysterectomy, BSO, infracolic omentectomy, pelvic and paraortic lymphadenectomy.

**Radical debulking (57%)**: standard techniques *plus* radical abdominal hysterectomy, and/or bowel resection, and/or gastrocolic ligament resection.

**Supraradical debulking (19%)**: standard and radical techniques *plus* combined large and small bowel resection, and/or splenectomy, and/or diaphragm resection, and/or liver resection, and/or exenteration.

*Sharma S, et al AJOG 2005*
Cytoreduction in advanced ovarian cancer

UCSC

Sharma

- Standard
- Radical
- Supraradical
### Variable

<table>
<thead>
<tr>
<th></th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cases</td>
<td>87</td>
</tr>
<tr>
<td>PCS</td>
<td>50 (57.4)</td>
</tr>
<tr>
<td>IDS</td>
<td>16 (18.4)</td>
</tr>
<tr>
<td>Recurrence</td>
<td>21 (24.2)</td>
</tr>
</tbody>
</table>

### Type of surgery

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ABC</td>
<td>18 (20.7)</td>
</tr>
<tr>
<td>Stripping</td>
<td>56 (64.4)</td>
</tr>
<tr>
<td>Resection</td>
<td>13 (14.9)</td>
</tr>
</tbody>
</table>

### Complications

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pleural effusion</td>
<td>37 (90.2)</td>
</tr>
<tr>
<td>PNX</td>
<td>4 (9.8)</td>
</tr>
</tbody>
</table>
Main reasons for non-optimal cytoreduction

- Unstable intra-operative physiology 2.3%
- Advanced age or medical problems 11.2%
- Unresectable upper abdominal metastases 84.7%
- Unresectable pelvic disease 1.8%

(Eisenkop and Spirtos, 2001)
Randomised EORTC-GCG/NCIC-CTG Trial on NACT + IDS versus PDS

Ovarian, tuba or peritoneal cancer
FIGO stage IIIc-IV (n = 718)

Randomisation

Primary Debulking Surgery
- 3 x Platinum based CT
- Interval debulking (not obligatory)
- > 3 x Platinum based CT

Neoadjuvant chemotherapy
- 3 x Platinum based CT
- Interval debulking if no PD
- > 3 x Platinum based CT

Primary Endpoint: Overall survival
Secondary endpoints: Progression Free Survival, Quality of Life, Complications
Impact of interval debulking surgery on clinical outcome in primary unresectable FIGO stage IIIc ovarian cancer patients


Oncology 2003.
1. **Completeness** (RT = 0) of cytoreduction at PCS should be considered the gold standard in the surgical management of AOC.

2. Patients in whom complete/optimal PDS is not achievable might be treated with NACT followed by IDS, and S-LPS should be included in their management.

Submitted
How should we select AOC patients for NACT instead of PCS?

A review (1980-2009)

- Ca125: 17 retrospective
- CT/MRI: 8 retrospective
- S-LPS: 5 retro/prospective
- Clinico-pathological variables: 5 retrospective

A universally applicable clinical model that can predict which patients will undergo optimal cytoreduction remains elusive.

*Int J Gynecol Cancer 2010; 201: S1-11*
Role of CT scan-based and clinical evaluation in the preoperative prediction of optimal cytoreduction in advanced ovarian cancer: a prospective trial

CT scan still represents a valid tool into address the issue of preoperative prediction of ovarian cancer resectability at primary surgery, and its predictive performances might be improved by the inclusion of ECOG-PS data.
Role of laparoscopy in the natural history of OC

Primary surgery
- S-LPS
- IDS

Secondary cytoreduction
- S-LPS
- II look

Palliation
- S-LPS
Role of laparoscopy in the management of OC

Primary surgery

Role of laparoscopy to assess the chance of optimal cytoreductive surgery in advanced ovarian cancer: a pilot study

Anna Fagotti1, Francesco Fanfani2, Manuela Ludovisi3, Roberto Lo Vol1, Giuseppe Bibbolo4, Antonia Carla Tesu5, Giovanni Scambia6

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5Division of Gynecologic Oncology, Catholic University of the Sacred Heart, Rome, Italy

Secondary cytoreduction

A Laparoscopy-Based Score To Predict Surgical Outcome in Patients With Advanced Ovarian Carcinoma: A Pilot Study

Anna Fagotti, MD,1 Gabriella Ferrandina, MD,2 Francesco Fanfani, MD,1 Alfredo Ercoli, MD,2 Domenica Lorussi, MD,3 Marco Roos, MD,4 and Giovanni Scambia, MD1

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Prospective validation of a laparoscopic predictive model for optimal cytoreduction in advanced ovarian carcinoma

Anna Fagotti, MD; Gabriella Ferrandina, MD; Francesco Fanfani, MD; Giorgia Garganese, MD; Giuseppe Vizzielli, MD; Vito Carone, MD; Maria Giovanna Salerno, MD; Giovanni Scambia, MD

A Treatment Selection Protocol for Recurrent Ovarian Cancer Patients: The Role of FDG-PET/CT and Staging Laparoscopy

A. Fagotti1*, F. Fanfani2, G. Vezzielli3*, G. Scambia2, A. Giordano2, G. Vezzielli3, G. Scambia2

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Should laparoscopy be included in the work-up of advanced ovarian cancer patients attempting interval debulking surgery?

A. Fagotti1*, E. Fanfani2, G. Vezzielli3, V. Gallotta4, A. Ercoli5, A. Paglia5, R. Costantini5, M. Vighiotta5, G. Scambia5, G. Ferrandina6

*Division of Gynecologic Oncology, Catholic University of the Sacred Heart, Rome, Italy
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Rationale

- No definitive guidance or clinical recommendation for PCS vs. NACT.
- A variable percentage, from 10 to 80%, of AOC patients will undergo only explorative laparotomy.
- Parameters associated with the possibility of cytoreduction can be easily assessable by LPS.
- The surgeon may be more comfortable with a direct visualization of the cancer spread.
Evolution of S-LPS as a new diagnostic tool in AOC

- **2005:** S-LPS can subjectively assess OC (prospective evaluation)
- **2006:** Elaboration of an objective LPS-score (PIV) to assess OC (retrospective evaluation)
- **2008:** Retrospective validation of an objective LPS-score (PIV) to assess OC in an external centre
- **2009:** Reproducibility of PIV in the center it was developed.
- **2010:** Reproducibility of PIV in external centers.
- **2012:** Prospective multicentric validation of PIV.
95 pts accrued

31 pts excluded
(51.6% ASA III-IV)
(48.4% large-size mass)

64 pts enrolled

64 Complete clinico-radiological examination

64 Laparoscopy

64 Standard longitudinal laparotomy
### Predictive index parameter

<table>
<thead>
<tr>
<th>Predictive index parameter</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>PPV (%)</th>
<th>NPV (%)</th>
<th>Accuracy (%)</th>
<th>Point value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ovarian masses (mono-bilateral)</td>
<td>60</td>
<td>29</td>
<td>29</td>
<td>60</td>
<td>39</td>
<td>0</td>
</tr>
<tr>
<td>Omental cake</td>
<td>57</td>
<td>81</td>
<td>63</td>
<td>77</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td>Peritoneal carcinosis</td>
<td>69</td>
<td>79</td>
<td>67</td>
<td>81</td>
<td>75</td>
<td>2</td>
</tr>
<tr>
<td>Diaphragmatic carcinosis</td>
<td>69</td>
<td>84</td>
<td>65</td>
<td>80</td>
<td>80</td>
<td>2</td>
</tr>
<tr>
<td>Mesenteral retraction</td>
<td>50</td>
<td>95</td>
<td>85</td>
<td>77</td>
<td>78</td>
<td>2</td>
</tr>
<tr>
<td>Bowel infiltration</td>
<td>70</td>
<td>89</td>
<td>78</td>
<td>84</td>
<td>82</td>
<td>2</td>
</tr>
<tr>
<td>Stomach infiltration</td>
<td>11</td>
<td>100</td>
<td>100</td>
<td>82</td>
<td>82</td>
<td>2</td>
</tr>
<tr>
<td>Liver metastases</td>
<td>35</td>
<td>94</td>
<td>75</td>
<td>76</td>
<td>76</td>
<td>2</td>
</tr>
</tbody>
</table>

*Am J Obstet Gynecol. 2008*
Prospective validation of a laparoscopic predictive model for optimal cytoreduction in advanced ovarian carcinoma

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OVERALL LAPAROSCOPIC PREDICTIVE MODEL (PIV) ACCORDING TO DIFFERENT CUT-OFF VALUES

<table>
<thead>
<tr>
<th>$PIV$</th>
<th>$NPV$ (%)</th>
<th>Unnecessarily explored $(1 - NPV)$ (%)</th>
<th>$PPV$ (%)</th>
<th>Inappropriately unexplored $(1 - PPV)$ (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>89.4</td>
<td>10.6</td>
<td>58.5</td>
<td>41.5</td>
</tr>
<tr>
<td>2</td>
<td>84.3</td>
<td>15.7</td>
<td>64.2</td>
<td>35.8</td>
</tr>
<tr>
<td>4</td>
<td>80.8</td>
<td>19.2</td>
<td>72.7</td>
<td>27.3</td>
</tr>
<tr>
<td>6</td>
<td>71.2</td>
<td>28.8</td>
<td>90</td>
<td>10</td>
</tr>
<tr>
<td>8</td>
<td>59.5</td>
<td>40.5</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>51.4</td>
<td>48.6</td>
<td>100</td>
<td>0</td>
</tr>
</tbody>
</table>
Should laparoscopy be included in the work-up of advanced ovarian cancer patients attempting interval debulking surgery?

A. Fagotti a,*, F. Fanfani a, G. Vizzielli a, V. Gallotta a, A. Ercoli b, A. Paglia b, B. Costantini a, M. Vigliotta a, G. Scambia a, G. Ferrandina b

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
<th>Acc.</th>
<th>Point value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Omental cake</td>
<td>70.4</td>
<td>83.8</td>
<td>56.7</td>
<td>71.6</td>
<td>0</td>
</tr>
<tr>
<td>Diaphragmatic carcinosis</td>
<td>62.8</td>
<td>84.4</td>
<td>54.3</td>
<td>68.6</td>
<td>0</td>
</tr>
<tr>
<td>Peritoneal carcinosis</td>
<td>61.4</td>
<td>87.1</td>
<td>55.3</td>
<td>69.6</td>
<td>0</td>
</tr>
<tr>
<td>Mesenteric retraction</td>
<td><strong>97.6</strong></td>
<td><strong>85.4</strong></td>
<td><strong>92.3</strong></td>
<td><strong>86.9</strong></td>
<td><strong>2</strong></td>
</tr>
<tr>
<td>Bowel infiltration</td>
<td>84.1</td>
<td>86.7</td>
<td>70.8</td>
<td>80.6</td>
<td>2</td>
</tr>
<tr>
<td>Stomach infiltration</td>
<td>100</td>
<td>68.3</td>
<td>100</td>
<td>70.3</td>
<td>2</td>
</tr>
<tr>
<td>Liver metastases</td>
<td>100</td>
<td>68.2</td>
<td>100</td>
<td>70.6</td>
<td>2</td>
</tr>
</tbody>
</table>
Algorithm of AOC patients at the UCSC (Rome-Campobasso)

- **AOC S-LPS**
  - **PIV < 8**
    - OPTIMAL CYTOREDUCTION
    - PROGRESSION
      - II-line CT
  - **PIV > 8**
    - NACT (3-4 cycles)

- RECIST/GCIC criteria
  - STABLE/PARTIAL RESPONSE
    - S-LPS
      - **PIV < 4**
        - IDS
      - **PIV > 4**
        - Standard or II-line CT
  - COMPLETE RESPONSE
    - IDS

- IDS
External validation of a laparoscopic-based score to evaluate resectability of advanced ovarian cancers: Clues for a simplified score

Jean-Luc Brun\textsuperscript{a,\*}, Roman Rouzier\textsuperscript{a,\textbar}, Serge Uzan\textsuperscript{a,\textbar}, Emile Darai\textsuperscript{a,\textbar}

\textsuperscript{a} Department of Obstetrics and Gynaecology, Hôpital Tenon, Assistance Publique des Hôpitaux de Paris, F-75020 Paris, France
\textsuperscript{b} UPRES EA 4053, Université Pierre et Marie Curie Paris 6, F-75005 Paris, France

ROC curve analysis comparing the laparoscopy-based scores in Tenon patients (full line) and Fagotti's patients (dotted line) treated by primary surgery.

ROC curve analysis comparing the modified laparoscopy-based score in Tenon patients (full line) and the laparoscopy-based score in Fagotti's patients (dotted line) treated by primary surgery.
To quantify more precisely the intra-abdominal extent of AOC, a number of numerical ranking systems have been proposed, such as: the Peritoneal Cancer Index (PCI) by Sugarbaker; the Eisenkop’s score and the Fagotti’s score (PIV). The major difference between them is represented by the laparoscopic approach in the last one, thus keeping pace with the times.

<table>
<thead>
<tr>
<th>Correlation matrix between scores (correlation coefficient r)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Aletti</td>
</tr>
<tr>
<td>Eisenkop</td>
</tr>
<tr>
<td>PCI</td>
</tr>
<tr>
<td>Fagotti</td>
</tr>
<tr>
<td>FIGO</td>
</tr>
<tr>
<td>Fagotti-modified</td>
</tr>
</tbody>
</table>

FIGO, International Federation of Obstetrics and Gynecology; PCI, peritoneal cancer index.  
^a p < .0001; ^b p < .01; ^c p < .001.
Training the fellows to the use of a Laparoscopic Score to predict optimal cytoreduction in AOC patients: learning curve and pitfalls

Suspicious AOC pts

Clinico-radiological examination

S-LPS Fellow → Evaluation

S-LPS Senior → Evaluation

Comparison

PI<8 → Laparotomy

PI>8 → NACT
Training the fellows to the use of a Laparoscopic Score to predict optimal cytoreduction in AOC patients: learning curve and pitfalls

\[ p = n. s. \]

Submitted
Validation of a laparoscopic score to predict the chance of optimal cytoreduction in advanced ovarian cancer patients: an open-label prospective multicentric-trial.

(OLYMPIA-MITO13)
At present..

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Start-up</strong></td>
<td>25/3/2010</td>
</tr>
<tr>
<td><strong>Time from start</strong></td>
<td>12 months</td>
</tr>
<tr>
<td><strong>Member centers</strong></td>
<td>21</td>
</tr>
<tr>
<td><strong>Enrolling centers</strong></td>
<td>12 (57.1%)</td>
</tr>
<tr>
<td><strong>Enrolled cases</strong></td>
<td>68</td>
</tr>
<tr>
<td><strong>Eligible cases</strong></td>
<td>60* (88.2%)</td>
</tr>
</tbody>
</table>

*poor quality of video, previous chemotherapy treatment*
Catholic laparoscopy advanced surgery school

www.classsurgery.com
gyneducational@rm.unicatt.it
**Catholic laparoscopy advanced surgery school**

**Surgical Endoscopy**

- CORSO BASE DI LAPAROSCOPIA
- CORSO AVANZATO DI LAPAROSCOPIA IN GINECOLOGIA (Sessione pratica su modello chirurgico sperimentale)
- CORSO AVANZATO DI CHIRURGIA LESS (Sessione pratica su modello chirurgico sperimentale)
- CORSO DI ISTERECTOMIA LAPAROSCOPICA
- TRATTAMENTO LAPAROSCOPICO DELL'ENDOMETRIOSI
- CORSO DI CHIRURGIA RICOSTRUTTIVA LAPAROSCOPICA DELL'APPARATO DI SOSPENSIONE DEGLI ORGANI PELVICI
- CORSO BASE DI ISTEROSCOPIA DIAGNOSTICA ED OPERATIVA
- INTERNATIONAL ADVANCED COURSE OF LAPAROSCOPY IN GYNECOLOGY
- INTERNATIONAL ADVANCED COURSE ON LESS SURGERY
- NEUROPELVEOLOGY ADVANCED COURSE

**Laparotomy**

- CHIRURGIA E TRATTAMENTI COMPLEMENTARI NEL TUMORE OVARIICO
- CHIRURGIA ADDOMINO PELVICA AVANZATA "IL TEAM GINECOLOGO ONCOLOGO": COMPETENZE INTEGRAZIONI RISULTATI
- CHIRURGIA VAGINALE AVANZATA - ONCOLOGICA E RICOSTRUTTIVA

**Surgical Anatomy**

- ANATOMIA CHIRURGICA DELLA PELVI E DELL'ADDOME PER GINECOLOGI (Sessione pratica su cadavere)

**Robotic Surgery**

- CORSO BASE DI CHIRURGIA ROBOTICA

**Colposcopy**

- CORSO TEORICO PRATICO DI COLPOSCOPIA
Roma
Policlinico A. Gemelli
Università Cattolica del Sacro Cuore

Campobasso
Giovanni Paolo II
Centro ad Alta Tecnologia nelle Scienze Biomediche

Padova
Policlinico di Abano Terme

Rionero in Vulture
I.R.C.S.S. C.R.O.B.

Parigi
A1K
Université Paris-Descartes
Laboratoire d’Anatomie

Tirana
Ospedale Universitario di Ginecologia e Ostetricia “Queen Geraldina”