European Study of Radical Prostatectomy: time trends in Europe, 1993–2005

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INTRODUCTION

Prostate cancer remains one of the main causes of cancer-related mortality in western countries; from 2000 to 2003, the age-adjusted incidence rate was 28.5/100 000 men in the USA [1] and 27.2/100 000 in 2001 in the UK [2]. Nevertheless, after the widespread use of PSA testing, prostate cancer has increasingly been reported at earlier stages, and the disease is often diagnosed at a localized stage suitable for curative treatment [3].

Radical prostatectomy (RP) has become accepted as the preferred curative treatment by many patients [4,5], and in 2003 it was offered to ≈70 000 patients in the USA [6]. The USA treatment trends were 65% surgery, 30% external radiotherapy and 5% brachytherapy in 1990, and 33%, 31% and 36%, respectively, in 2005; in Europe, the respective trends were 71%, 24% and 5% in 1990, and 59%, 28% and 13% in 2000.

Surgical refinements and randomized studies underlining oncological benefits have led to an increased acceptance of RP, but surgery-related complications such as bleeding, postoperative pain and prolonged hospital stay, as well as functional losses such as incontinence and erectile dysfunction, have been major concerns for patients and treating physicians. Therefore, convincing the patient to undergo a potentially life-saving procedure has been the greatest challenge in urology for several years. Obviously, RP must meet three criteria. First, it must offer oncological benefits in terms of disease-specific and progression-free survival. Second, intra- and peri-operative morbidity, in terms of bleeding, pain and hospital stay, should be minimal. Finally, it should produce good functional results (continence and potency) and strongly affect issues relating to the patient’s quality of life.

The European Study of Radical Prostatectomy (ESRPE) was initiated to evaluate oncological and functional outcomes in various European university centres, and to investigate trends between 1993 and 2004/2005. Sites included (number of patients) were Vienna (1342), Paris-Bichat (494), Brussels (1012), Milan (1258), Modena (853), London (744), Athens (426), Budapest (314) and Hamburg (534). Some key points relating to the project are

- 37 study centres;
- RP 1993–2004;
- follow-up by local standards;
- retrospective/prospective analysis (83.5%/16.5%);
- pathological features;
- functional results (patients vs surgeons);
- biochemical recurrence rates at various stages;
- clinically localized disease;
- PSA level of 2.5–15 ng/mL at the time of surgery;
- 63% referrals with out-of-clinic biopsies;
- 37% biopsy + surgery at the local institution;
- 6% confirmation biopsy at surgery site;
- 81% had RP;
- 17% had radiation therapy;
- 2% watchful waiting.

![FIG. 1. a, Surgical complications, and b, medical complications. ESOU, European Society of Oncological Urology.](image-url)
Open RP standards were recorded as: interrupted sutures, 93%; running sutures, 7%; mean number of sutures, seven; mean duration of catheterization, 8 days; ascending/descending open RP, 91%/9%; bladder neck preservation, 48%.

In 2000, a robotic surgical device (the da Vinci® Surgical System, Intuitive Surgical, Sunnyvale, CA, USA) was developed for the urological community. This device comprises a surgical console controlling three or four robotic arms that are easily inserted through laparoscopic ports, and which are under the control of the surgeon operating the console. This device provided clear benefits and the number of users worldwide rapidly increased [7]. Five factors were responsible for this technical revolution: (i) substantial magnification (up to x 12) of the surgical field; (ii) three-dimensional vision; (iii) seven degrees of freedom in moving the instruments (compared with four for laparoscopic RP); (iv) a reduction in the scale of movements (up to a factor of 5); (v) elimination of physiological tremor.

For a surgeon inexperienced in laparoscopy the use of the robotic device means transferring the skills of open surgery to a minimally invasive setting within 8–12 cases rather than the 80–100 of traditional laparoscopy [8]. Data from the largest study of robot-assisted RP (RARP), involving >2600 patients, showed the benefits of this procedure when used by experienced surgeons. That study reported a negligible median estimated blood loss (EBL, 100 mL), an incontinence rate of 0.8% at 12 months, and a potency rate of 93%, with an actuarial 5-year biochemical recurrence rate of 8.4% [9].

In a single-surgeon study comparing RARP and retropubic RP, Ahlering et al. [10] showed that, after learning over 45 procedures, there were equal outcomes in terms of surgical margins and continence, whereas EBL and hospital stay were significantly improved in the RARP group. A significant reduction in EBL has consistently been reported for RARP, and most studies also report advantages in terms of postoperative morbidity and return to activity [4]. The ESRPE evaluated complication rates of open RP and showed a significant reduction in the rates over time; a significant reduction in surgical complications reflected improved surgical technique and the use of new devices (Fig. 1a,b). Interestingly, stage migration, as shown in Fig. 2, is the most important finding of the past 10 years that is relevant to our patients (Table 1).

At 10 years of follow-up, there was recurrence of high PSA levels in 38% of cases, with an annual increase that reached a plateau 7 years after RP (Fig. 3). Surgical margins have been well documented at various centers, making trends over time easy to investigate. Our observation of a continuous reduction in the positive-margin rate over time and a levelling off in 1999–2000 indicates that these were the important years in standardizing open RP procedures (Fig. 4a,b). Recent studies investigated similar outcome variables with RARP, and reported identical or better outcomes [11]. Despite claims of excellent results with robotic procedures, to date there have been no randomized trials comparing traditional and minimally invasive treatments, and no reports of significant advantages of RARP in terms of peri-operative or functional outcomes [12].

In terms of costs, RARP has been considered as more expensive than traditional RP, even when considering the possibly shorter
hospital stay [13,14]. Nonetheless, Intuitive Surgical claimed that in 2005 >10% of RPs in the USA were RARPs, and this percentage seems to be increasing.

Overall, open RP has developed markedly over the past decade. Between 1993 and 2004/2005 there was a clear ‘stage shift’, with increasing proportions of T1c cancers (16% in 1993 vs 74% in 2004/2005). The percentage of organ-confined cancers increased from 30% to 82%, and positive-margin rates decreased from 38% to 18%. Furthermore, there was a favourable trend in terms of surgical and medical complications.

New competitor devices, reduced costs and technological developments will probably lead to more widespread use of the new technical improvements in RP, such as RARP. However, clear benefits need to be confirmed in randomized trials.

CONFLICTS OF INTERESTS

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REFERENCES


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**Abbreviations:** EBL, estimated blood loss; ESRPE, European Study of Radical Prostatectomy; (RA)RP, (robot-assisted) radical prostatectomy.