Mini-review

Urological malignancy in Hong Kong: the trend and the practice

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Abstract

In Hong Kong, urological malignancy accounted for 9.55% of all the new cases of cancer in 2012. In the male population, prostate cancer was the third most commonly diagnosed cancer, and the fifth leading cause of cancer death. Age-standardized rate of prostate cancer incidence rose from 11.5 per 100 000 men in 1992 to 28.5 per 100 000 men in 2012. On the other hand, age-standardized rate of bladder cancer incidence dropped from 6.4 per 100 000 in 2003 to 3.0 per 100 000 in 2012. The incidence of kidney cancer remained stable in recent years, with an age-standardized rate of 4.8 per 100 000 in 2012. The introduction of the robotic surgical system has made robotic-assisted laparoscopic radical prostatectomy the most common mode of surgical treatment for prostate cancer in Hong Kong. Robotic-assisted laparoscopic radical cystectomy and robotic-assisted laparoscopic partial nephrectomy have been gaining popularity in the locality. Minimal-invasive surgical techniques as well as different systemic therapies have led to revolutionary changes in the urology community in Hong Kong. The existing territory-wide surveillance of cancer incidence and mortality trends continue to provide us with clues to aetiology and the effects of improved diagnostic and treatment techniques.

Key words: prostate cancer, bladder cancer, kidney cancer

Introduction

Urological malignancy has been a significant subset of cancer cases in the world. In 2012, the estimated new cases of prostate cancer were 1 111 700 cases globally, second only to cancer of the respiratory tract in the male population (1). Bladder cancer and kidney cancer were also among the top 10 most frequently diagnosed cancers in male patients worldwide. In developed countries, prostate cancer was among the leading causes of death among male, after lung cancer and colorectal cancer. As for bladder cancer, the incidence rates have been declining or stable in most Western countries over the past few decades.

In Hong Kong, a similar pattern was observed concerning urological malignancy. Hong Kong Cancer Registry is a population-based cancer registry compiling reports on cancer statistics from all major medical institutions in Hong Kong (2). In 2012, we had 27 848 new cases of malignancy from all sites, among which 2659 cases were urological malignancy, accounting for 9.55% of all the new cases. In the male population, lung cancer, colorectal cancer and prostate cancer were the top three most commonly diagnosed cancers. Kidney cancer was within the top 10 most commonly diagnosed cancers in male, with a relative frequency of 2.6%. The age-standardized rate (ASR) of urological malignancy incidence was 22.8 per 100 000. This figure was mildly increased when compared with that in 2003, but similar to that in 2008 (Table 1). Concerning cancer mortality of urological malignancy, the ASR was 5.5 per 100 000 in 2012, which was comparable with the figures in 2003 and 2008.

In Hong Kong, cancers of prostate, bladder and kidney have contributed to >95% of all the urological malignancy, and there were only 71 testicular cancer and 32 cancer of penis and male genital region diagnosed in 2012. Therefore, our emphasis of this review would be on the three more common malignancies.
Table 1. Incidence and mortality of urological malignancy

<table>
<thead>
<tr>
<th>Year</th>
<th>Incidence (per 100 000 persons)</th>
<th>Mortality (per 100 000 persons)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude rate</td>
<td>ASR</td>
</tr>
<tr>
<td>2003</td>
<td>27.3</td>
<td>20.3</td>
</tr>
<tr>
<td>2008</td>
<td>33.5</td>
<td>22.2</td>
</tr>
<tr>
<td>2012</td>
<td>32.7</td>
<td>22.8</td>
</tr>
</tbody>
</table>

ASR, age-standardized rate; which is calculated based on the reference standard population used.

Prostate cancer

Prostate cancer was known to have a higher prevalence in Western countries than in Asia. The ASR of new prostate cancer incidence in Asia was found to be 7.2 per 100 000, compared with 59.3 per 100 000 in Europe (3), and 142.1 per 100 000 in the USA (4). While in general prostate cancer is less prevalent in Asia than in its western counterpart, the incidence of prostate cancer in our locality has been on a steady increase during the past few decades. In Hong Kong, the ASR of prostate cancer incidence rose from 11.5 per 100 000 men in 1992 to 22.0 per 100 000 men in 2002, then to 28.5 per 100 000 men in 2012 (2). The median age at diagnosis was 73 years (5). Prostate cancer is now the third most common cancer in the male population of Hong Kong, and the fifth leading cause of death from cancer. Such an increase in prostate cancer incidence can be attributed to a wider access to prostate specific antigen (PSA) screening, as well as environmental factors with respect to the consumption of Western diet (6). The mortality-to-incidence rate ratio was 20%, compared with 18% in Europe and 25% worldwide (6). This is in part influenced by the economic situation of the locality.

With respect to a lower incidence of prostate cancer in Hong Kong than in the west, currently there is no national PSA screening programme in our locality. Although different age-specific PSA cut-offs have been established for different ethnicities in Asia, for most centres in Hong Kong a PSA cut-off of 4 ng/ml is commonly employed. Urine prostate cancer antigen 3 (PCA3) was also found to be a useful tool in predicting prostate cancer in our locality, with the best cut-off for the PCA3 ratio found to be 1.127 (7). In the two teaching hospitals in Hong Kong (Prince of Wales Hospital and Queen Mary Hospital), >50% of the patients who underwent transrectal ultrasound-guided biopsy of prostate had their PSA falling in the range of 4–10 ng/ml. Ng et al. (8) reported that the use of prostate volume index (pVHI) had the best predict of the prostatic biopsies results in patients with PSA in the range of 4–10 ng/ml, when compared with PSA, PSA density, free-to-total PSA ratio and p2PSA-to-free PSA ratio. pVHI is expected to gain more and more popularity in our locality to avoid unnecessary prostatic biopsies.

Both radical prostatectomy and intensity-modulated radiotherapy are available treatments for the management of prostate cancer in Hong Kong. The number of radical prostatectomy performed in our locality has been on a rise in recent years. Data from all the government hospitals in Hong Kong revealed that we had 232 radical prostatectomies from July 2009 to June 2010. From July 2013 to June 2014, such number rose to 278 cases (9). Among these 278 radical prostatectomies, 240 cases were robotic-assisted laparoscopic prostatectomy (RALP), and the rest were done with laparoscopic approach.

Currently there are seven centres in Hong Kong with the da Vinci Surgical System (Intuitive Surgical, Sunnyvale, CA, USA), 5 in the public sector and 2 in the private sector. Caseloads from the public hospitals in Hong Kong account for the majority of RALP in Hong Kong. In the early development of the RALP programme in Hong Kong, Yip et al. (10) reported that 74.9% of patients with RALP had pT2 disease, and 23.4% with pT3 disease. Overall trifecta rate at 12 months was 37.3%. With the technique of RALP getting more popular and more mature in our locality, we expect a further improvement in our results in our latest data.

Management of prostate cancer in most institutions of Hong Kong follows European Association of Urology (EAU) guidelines. As neither gonadotropin-releasing hormone (GnRH) agonist nor GnRH antagonist is covered by the government health-care programme, there are still a significant number of patients who opt for surgical castration as a means of hormonal manipulation in Hong Kong. From the series reported by Teoh et al. (11) in a teaching hospital in Hong Kong over 10 years, 387 patients underwent surgical castration and 297 patients underwent medical castration from 2000 to 2009. Upon regression analysis of the same series, surgical castration was found to be a statistically significant risk factor for cardiovascular thrombotic events, especially in elderly men with known history of hyperlipidaemia. One postulation for this observation is that surgical castration reduces serum testosterone to a lower level than the GnRH analogue (12), which might in turn increase the risk of cardiovascular thrombotic events (13). Another possible explanation takes into account of a temporary follicle-stimulating hormone (FSH) surge during the first few weeks of treatment of GnRH analogue, on contrary to a persistently elevated FSH level in surgical castration patients. FSH receptors have been found on the luminal endothelial surface of proliferating tissue, and they may play a role in endothelial cell function and lipid metabolism that may increase the risk of cardiovascular events in men receiving surgical castration (14). The better cardiovascular profile associated with the GnRH analogue might result in a higher proportion of medical castration versus surgical castration in our locality in the future.

Castration-resistant prostate cancer (CRPC) is a common scenario faced by urologists in Hong Kong and worldwide. Docetaxel chemotheraphy has been an important treatment option available to patients with CRPC. A tertiary centre in Hong Kong reported a PSA response rate with docetaxel chemotherapy to be 36%, and the cancer-specific survival to be 13.0% (95% confidence interval, 9.6–16.3) months (5). With the availability of newer agents such as abiraterone and enzalutamide, we await update data on the treatment outcome in patients with CRPC in our locality.

Bladder cancer

In Hong Kong, 384 new cases of bladder cancer and 184 deaths occurred in 2012. The majority of bladder cancer occurs in men. Bladder cancer incidence rates have been declining in most Western countries over the past few decades (1). A similar trend is observed in Hong Kong. The ASR of bladder cancer incidence dropped from 6.4 per 100 000 in 2003 to 3.2 per 100 000 in 2008, to 3.0 per 100 000 in 2012. This trend also applies to the mortality rate that decreases from 1.8 per 100 000 in 2003 to 1.2 per 100 000 in 2012. Such a mortality rate is relatively low compared with that in the USA (4.0 per 100 000) (11), and the decreasing mortality trends in Hong Kong as well as in Western countries largely reflect reductions in smoking prevalence (15).

From a hospital-based cross-sectional survey in Hong Kong, most urologists in the locality adopted the EAU guideline or the American Urological Association guideline in the management of bladder cancer (16). All hospitals used mitomycin C for the immediate post-operative
intravesical chemotherapy after transurethral resection of bladder tumour. For the majority, the duration of maintenance therapy of intravesical immunotherapy for high-risk non-muscle-invasive bladder cancer ranged from 3 months to 3 years.

Concerning muscle-invasive bladder cancer, from July 2013 to June 2014, there were 65 radical cystectomies in total across all public hospitals in Hong Kong (9). Open approach to the procedure was the majority, accounting for 64.6%. The other approaches were robot-assisted radical cystectomy (20.0%) and laparoscopic radical cystectomy (15.4%). Of all the radical cystectomy patients, 83.1% of them had ileal conduit diversion, while the rest had neo-bladder or continent pouch reconstruction. The mean 30-day crude morbidity rates for laparoscopic and robot-assisted cystectomy were 40.0 and 53.8%, respectively. These figures were comparable with other series of radical cystectomy using a minimal-invasive technique in the literature (17,18), and demonstrated a more favourable morbidity profile when compared with its open-approach counterpart. In a retrospective review of 117 radical cystectomy cases in a teaching hospital in Hong Kong, the 30-day mortality and 5-year cancer-specific mortality rates were 3 and 33%, respectively (19). Age, tumour stage and the pre-operative serum albumin level were found to be the independent predictors of mortality after radical cystectomy. Unlike the traditional central-docking technique, Chan et al. (20) reported a series of robot-assisted radical cystectomy using a side-docking technique with satisfactory results. Such an approach is found to provide better peritoneal access with the advantage of allowing simultaneous urethrectomy and transvaginal retrieval of the specimen without compromising the dexterity and precision of the robotic surgical system.

The enhanced-recovery-after-surgery protocol has been adopted in Prince of Wales Hospital as well as certain hospitals in Hong Kong. Such protocol includes multimodal perioperative care pathways designed to achieve early recovery after surgical procedures by maintaining pre-operative organ function and reducing the profound stress response following surgery (21). With such protocol, a shorter hospital stay and an earlier recovery are expected. However, hospital and surgeon volume has a significant impact on the perioperative outcome of radical cystectomy as well. Among the 10 urological centres in the public sector in Hong Kong, only two centres performed >10 radical cystectomies in a year from July 2013 to June 2014 (9). While this might seem to fall short of the recommendation made by the Bladder Cancer Collaborative Group concerning the proficiency of performing radical cystectomy (22), a closer partnership among urologists in our locality would further improve the outcome of bladder cancer treatment.

Kidney cancer

In 2012, there were 213,900 new cases of kidney cancer in the male population worldwide. It ranked the ninth most commonly diagnosed cancer in the world for male, and the sixth in developed countries (1). In Hong Kong, cancer of the kidney ranked the ninth most commonly diagnosed cancer in 2012 in the male population. Since 2003, the incidence of kidney cancer has been slowly rising, and has become stable in recent few years. ASR of kidney cancer incidence in Hong Kong for genders was 4.9 per 100,000 in 2003, which then decreased to 4.9 per 100,000 in 2008. In 2012, ASR of kidney cancer incidence in Hong Kong was 4.8 per 100,000, with a mortality rate of 1.6 per 100,000 (2). The rise in incidence of kidney cancer in early 21st century has largely been attributed to the increased use of imaging techniques, which resulted in an increased detection of incidental tumours.

The incidence of kidney cancer was relatively low when compared with that in Europe (male: 4.1–31.4 per 100,000; female: 2.1–14.5 per 100,000) (23) and the USA (17.09 per 100,000) (24). Such differences could be the result of a lower prevalence of smoking (25) and in general a lower body mass index in Hong Kong than in Europe and the USA. Since cigarette smoking (26) and a higher body mass index (27) were shown to have a positive correlation with an increased risk of kidney cancer, the demographic characteristics in Hong Kong might have favoured a lower incidence in our locality.

Between July 2013 and June 2014, there were 145 radical nephrectomies and 132 partial nephrectomies performed across all government hospitals in Hong Kong for cancer of renal parenchyma. Among the 132 cases of partial nephrectomy, 27.3% adopted a laparoscopic or retroperitoneoscopic technique, 15.1% adopted a robot-assisted laparoscopic technique, and 57.6% adopted an open technique. In Queen Mary Hospital, a comparison between standard laparoscopic partial nephrectomy (LPN) and robot-assisted laparoscopic partial nephrectomy (RALPN) was reported in the early phase of development (28). No significant difference was found between the two groups (LPN vs RALPN) with respect to the operating room time (361 vs 376 min; P = 0.722) and estimated blood loss (328 vs 329 ml; P = 0.994). A statistically significant shorter mean warm ischaemic time for the robot-assisted group was noted (40 vs 31 min; P = 0.032). Respective renal functional outcomes as shown by the difference between Day 0 and Day 60 serum creatinine levels were comparable (+7 vs +10 mmol/l; P = 0.605). With RALPN gaining a wider acceptance among urologists in Hong Kong, we expect updates of our local data in this new era of kidney surgery.

Targeted therapy is an integral part in the management of metastatic renal cell carcinoma (RCC). In our locality, targeted therapy is not yet covered by the government health-care scheme. Candidates of targeted therapy have to bear all the medical expense. However, there are a few subsidy schemes available to patients with financial difficulty. An example is Community Care Fund Medical Assistance Programme. Patients having their medical expense more than a significant portion of their household income are eligible candidates. As of August 2015, sunitinib and pazopanib are included in the list of drugs supported by Community Care Fund Medical Assistance Programme (29). Prof. H. C. Ho Memorial Assistance Programme organized by the Hong Kong Anti-Cancer Society also provides financial assistance to patients in need of support for cancer treatment. Currently target therapy has become more and more popular in the oncology community. Chan et al. (30) reviewed the practice of cytoreductive nephrectomy (CRN) and the use of tyrosine-kinase inhibitor (TKI) in three tertiary centres in Hong Kong. From 2006 to 2013, 32 patients received TKI only without CRN. The other 41 patients received CRN, among which 53.7% received immediate target therapy subsequently, while 46.3% did not. The most commonly used TKI agents were sunitinib (76.9%) followed by sorafenib (11.5%) and pazopanib (7.7%). Systemic therapy for RCC has been evolving. The introduction of other novel agents for RCC would definitely further change the scene of urology community in Hong Kong.

Conclusion

While urological malignancy accounts for a significant proportion of cancer cases in Hong Kong, different urological cancers exhibit different epidemiological trends. Prostate cancer incidence rates have been increasing over the past 10 years in our locality. On the other hand, bladder cancer incidence rates have been declining and that of kidney cancer were stable. The introduction of the robotic surgical system as well as different systemic therapies has led to revolutionary changes in
the urology community in Hong Kong. Surveillance of cancer incidence and mortality trends provide us with clues to aetiology and the effects of improved diagnostic and surgical techniques. Such diligent effort must be continued in order to gain better insights into the prevention and treatment of malignancy, be it urological malignancy or malignancy of other sites.

Conflict of interest statement

None declared.

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