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Treatment of radiation-induced erectile dysfunction with low-intensity extracorporeal shock wave: A case report

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CASE STUDY

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ABSTRACT

Low-intensity extracorporeal shock wave therapy is a new treatment in treating vasculogenic erectile dysfunction. We report a case of low-intensity extracorporeal shock wave therapy used for treating radiation-induced erectile dysfunction. A 66-year-old gentleman with dyslipidemia and smoking presented with radiation-induced erectile dysfunction. Six sessions of low-intensity extracorporeal shock wave therapy were administered. Pre-treatment IIEF-5 score was 10 and post-treatment IIEF-5 score at one month was 19. Low-intensity extracorporeal shock wave therapy has the potential to treat radiation-induced erectile dysfunction.

Key Words
Erectile dysfunction, prostate cancer, radiation therapy, shock wave

Implications for Practice:

1. What is known about this subject?
Low-intensity extracorporeal shock wave therapy emerges as a novel treatment modality for vasculogenic erectile dysfunction.

2. What new information is offered in this case study?
Vasculogenic erectile dysfunction that is not responsive to PDE5 inhibitor could be treated with a shorter protocol, consisting six low-intensity extracorporeal shock wave treatment sessions, instead of twelve.

3. What are the implications for research, policy, or practice?
Further studies are required to explore the use of Low-intensity extracorporeal shock wave in penile rehabilitation.

Background

Erectile dysfunction (ED) is a well-recognised sequelae following treatment for prostate cancer.[1] The incidence of radiation-induced erectile dysfunction (RiED) reaches about 60–70 per cent in prospective studies.[2] Although it could be multi-factorial, the etiology of RiED is thought to be predominantly arteriogenic in origin.[3] Current treatment options for RiED are phosphodiesterase type 5 inhibitor (PDE5I), vacuum devices, penile injections, penile prostheses, penile suppositories and natural supplements. Many of these treatments are ineffective, invasive, expensive or associated with side effects.[4] In a study conducted by Incrocci L at el[5], sildenafil 100mg improved erections significantly as compared to placebo; 55 per cent of the patients had successful intercourse with sildenafil. However, 45 per cent of the patients were not responsive to PDE5I. Furthermore, 33.8 per cent of these initial PDE5I responders became non-responders in two years.

Low-intensity extracorporeal shock wave treatment (Li-ESWT) emerges as a novel treatment modality for ED. A systematic review and meta-analysis done by Lu Z et al.[6] showed promising result that Li-ESWT could significantly improve the International Index of Erectile Function (IIEF) and the Erection Hardness Score (EHS) of ED patients including those PDE5I non-responders. Both the IIEF and EHS questionnaires were validated tools most commonly

used to evaluate the therapeutic efficacy of ED treatment. There is no study reported yet on the use of Li-ESWT in treating RiED.

We present a case that demonstrates the potential efficacy of Li-ESWT to treat RiED patients who are non-responsive to PDE5I.

Case details

Mr T, a 66-year-old married Chinese gentleman, presented with five years history of worsening ED after hormonal and radiotherapy for prostate cancer in 2009. He started to have ED three years prior to the cancer treatment. His prostate cancer remitted successfully, but the treatment worsened his ED. Prior to the cancer treatment, he could respond to PDE5I partially, but had become totally non-responsive after the cancer treatment.

He also has a history of dyslipidaemia. There was no history of diabetes, hypertension, or ischaemic heart disease. Mr. T has roughly 40-pack-year smoking history. Examination was unremarkable. There were no features to suggest testosterone deficiency or thyroid disorder. He did not have any prostate tenderness or masses. We used the abridged version of the International Index of Erectile Function (IIEF-5) (otherwise known as the Sexual Health Inventory for Men or SHIM)[7] to evaluate Mr. T's ED severity before and after treatment. Mr. T's pre-treatment IIEF-5 score was 10.

Treatment

We treated Mr. T with six sessions of Li-ESWT over three weeks duration, conducting two sessions per week. This was a shortened protocol as compared to that used in the published studies[6]. Patient opted for the shortened protocol due to financial consideration. During each session, Li-ESWT was delivered by a special probe that was attached to a compact electrohydraulic unit with a focused shockwave source (Omnispec ED1000; Medispec, Germantown, MD, USA). We followed the treatment protocol used by Vardi et al.[8] The penis was manually stretched, and shock wave were delivered to the distal, mid and proximal penile shaft, as well as both the left and right crura. 300 shocks were delivered to each treatment point, i.e. a total of 1,500 per session. Each session was approximately 20 minutes in duration.

Mr. T was also given advice regarding smoking cessation as part of general advice to reduce his overall cardiovascular risk.

Treatment progress

Mr. T experienced early improvements. He reported having occasional spontaneous erections from the second session onwards. Mr. T was followed up four weeks after he completed his final session. During his follow up appointment, he reported at least one very satisfactory erection. His IIEF-5 score was 19 on re-evaluation. Additionally, Mr. T had stopped smoking when his treatment commenced.

Discussion

Mr. T was treated with six treatment sessions instead of twelve treatment sessions as documented in published clinical studies to date. An increase of at least five points under IIEF-5 is considered a significant clinical improvement;[6] his score increased nine points post treatment. His derived benefit despite this shortened protocol raises further questions on whether some patients would only require a shorter protocol. Mr. T's response to Li-ESWT is promising for patients with RiED, especially those PDE5I non-responders. Mr. T's history of dyslipidaemia and cigarette smoking puts him at higher risk of ED post-radiotherapy; Wang et al.[9] showed that the risk of ED post-treatment was higher as the number of vascular risk factors increased. Mr. T's case highlights the need for Li-ESWT to be studied further in treating RiED patients. If proven effective, Li-ESWT potentially provides another non-invasive option for this subset of patients aside from PDE5I. It remains to be seen how Li-ESWT would fit into a programme of penile rehabilitation.

Our follow up was short and it remains to be seen how Mr. T's progress is maintained. The published studies followed up their patients for up to six months.[6] It would be interesting to see how these patients fare over a longer period.

Smoking cessation could be a confounder for the improvement. A prospective study done by Pourmand et al.[10] showed 25 per cent improvement of erectile function among younger patients during follow-up one year after smoking cessation, but not much improvement among those patients who are older and have advanced ED. Mr. T, a 66-year-old with advanced ED, experienced a significant improvement after one month of the shock wave treatment. His improvement is less likely due to the effect of smoking cessation.

A further point to note here is that Mr. T was treated within a primary care setting. With the right case selection and appropriate funding, Li-ESWT provides the means for more ED patients to be treated in a location that is more accessible and reduces the need for additional referrals to

secondary care. The method provides a further option for primary care practitioners to treat erectile dysfunction in a safe and non-invasive manner.

Conclusion

This case report highlights the potential of Li-ESWT to treat ED in patients who have had radiotherapy for prostate cancer. Further studies are required to explore the use of Li-ESWT in penile rehabilitation.

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PEER REVIEW

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CONFLICTS OF INTEREST

The authors declare that they have no competing interests.

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PATIENT CONSENT

The authors, *Chan CW and Wong CH*, declare that:

1. They have obtained written, informed consent for the publication of the details relating to the patient(s) in this report.
2. All possible steps have been taken to safeguard the identity of the patient(s).
3. This submission is compliant with the requirements of local research ethics committees.