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Highlights

“SLT takes pressure control out of the hands of the patient and puts it back in the hands of the ophthalmologist, who can choose when best to apply it for each individual patient”

*Professor John Marshall, St. Thomas Hospital, London
Ellex SLT Symposium During ESCRS*

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“Why Did We Choose SLT?”

*Mr. Ejaz Ansari, The Eye Ear and Mouth Unit (EEMU), Maidstone Hospital, Kent, UK
Brian G. Bussey, Area Sales Manager, Haag-Streit UK Ltd*

An Interview With a Patient and His Ophthalmologist

At the end of July 2006, Mr. Ejaz Ansari from The Eye Ear and Mouth Unit (EEMU) of Maidstone Hospital in Kent performed selective laser trabeculoplasty (SLT) on Brian G. Bussey. Three weeks later, Ansari and Bussey related the experience to Regenerate, and Ansari discussed SLT in general.

Brian G. Bussey: The Glaucoma Patient's Point of View

Given his family history (several family members suffer from glaucoma), Bussey was aware that he risked developing the disease. In addition, while he was previously in practice as a dispensing optician, a colleague detected deep cupping of his optic discs.

Bussey's professional experience in ophthalmology gave him an in-depth understanding of the risks of glaucoma, and when he also found that his corneal thickness was only 460 μm , Bussey decided to make an appointment with Ansari for further evaluation.

Ansari diagnosed a borderline case of glaucoma, with pressures of OD 19 mmHg and OS 19 mmHg, taking into account corneal thickness correction. He suggested three different solutions: monitoring the condition as it evolved, initiating drug therapy to decrease intraocular pressure (IOP), or performing SLT to decrease IOP.

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Australian SLT User Group Debuts

The inaugural meeting of the Australian SLT User Group was held in Sydney on July 22, 2006. The gathering was held during the annual Australia and New Zealand Glaucoma Club (ANZGC)/ Australia and New Zealand Glaucoma Interest Group (ANZGIG) Congress, which provided a perfect opportunity to bring Ellex SLT users together.



During the meeting, user group members with clinical experience ranging from one month to more than three years were able to discuss their clinical experiences and thoughts on SLT, including patient outcomes and SLT awareness. Dr. Ivan

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Clinical Tips

Ivan Goldberg, MB,BS (Syd); FRANZCO, FRACS



Dr. Ivan Goldberg is a Clinical Associate Professor at the University of Sydney and Director of the Eye Associates, Sydney, and Glaucoma Services, Sydney Eye Hospital. Dr. Goldberg specializes in glaucoma diagnosis and management, serving as the President of the Association of International Glaucoma Societies (AIGS) and the South East Asia Glaucoma Interest Group (SEAGIG), and Vice-President of Glaucoma Australia.

Dr. Goldberg can be contacted via patientservices@eyeassociates.com.au.

Tips for Use of Selective Laser Trabeculoplasty

- Patients to be considered for SLT are those with visible trabecular meshwork on gonioscopy, whose intraocular pressure (IOP) needs to be lowered, and/or for whom medications are ineffective, intolerable, contraindicated or inappropriate.
- To minimize potential alarm and anxiety, patients should understand what is being done, how and why, and should know what reactions may follow.
- Consider pre-treatment with pilocarpine (to tauten the trabecular meshwork and to facilitate treatment), alpha-2 agonists and/or topical carbonic anhydrase inhibitors to protect against a post-SLT IOP spike. For the same reason, consider applying SLT to an eye in two sessions, each with 180 degrees of meshwork treated, separated by one to two weeks.
- Consider avoiding topical steroids and other anti-inflammatory agents so as not to inhibit cytokine release, the mechanism by which trabecular endothelial cells are thought to reduce IOP.
- Apply the laser energy as evenly as possible over the entire meshwork, with each application abutting the previous one.
- Aim for a minimal but definite champagne bubble reaction with each laser application. This requires titrating laser energy levels with meshwork pigmentation. While a mildly pigmented meshwork usually requires an energy setting of about 0.8mJ, one that is more heavily pigmented may need only 0.3 – 0.4mJ, and one that has no pigment and an amorphous appearance may need up to 1.6mJ.
- Titrating laser energy levels to achieve a minimal but definite champagne bubble response with each application means not only varying laser energy settings between eyes, but from one part of an eye's meshwork to another, depending on variations in pigmentation and reaction to previous treatments.
- Advise patients that a treated eye may become somewhat red and uncomfortable – even with a little photophobia – for a few days after each laser session. If the reaction is severe or troublesome, the patient should contact the ophthalmologist.
- If the clinical situation will allow, wait at least four weeks after completing the 360-degree meshwork treatment before assessing the IOP response to SLT.
- If there is a satisfactory IOP response that subsequently fails, consider repeating SLT. There would seem to be little value in repeating SLT if the first treatment provides no improvement whatsoever.

As an active 39 year old who is often away from home, Bussey didn't hesitate. “My choice was easy,” he commented. “From my professional and family experience, I know the damage generated by glaucoma at different stages. If we provide instruments to detect pathology earlier, why not treat it earlier?”

In addition, he explained, “I don't have time to put drops in my eyes, and, to be honest, because of my lifestyle I would probably be non-compliant. I am not yet 40 years of age and hope to have many years of active life ahead of me. I chose SLT.”

Two days after Bussey's initial visit, Ansari performed the procedure. The treatment of both eyes took 10 minutes (120 spots in each eye for 360° coverage).

Bussey reported that the treatment was generally comfortable within the eye, and that three shots produced a small pinprick. He did not feel any discomfort following treatment.

Mr. Ejaz Ansari: The Clinician's Point of View

The recurring issue of patient non-compliance led Ansari to read earlier works on the physical mechanisms of SLT. He treated his first patient four years ago, and now systematically offers all of his patients SLT as a first-line treatment option. For established glaucoma, in which the patient is taking multiple drugs and IOP remains difficult to control, Ansari's approach is different. In most of these cases, he proposes two treatment options: surgery or SLT.

“I strongly recommend SLT in order to reduce the number of drops and to give an adjunctive effect,” Ansari said. “SLT works very well in combination with beta blockers, as they have an impact on the production of aqueous humor and SLT improves outflow.”

Ansari gives his patients IOPIDINE drops preoperatively to reduce the risk of IOP spikes, as well as a three-day treatment of ACULAR (non steroidal anti-inflammatory) to minimize the inflammatory reaction.



Mr. Ejaz Ansari and Mr. Brian G. Bussey

“When I started performing SLT four years ago, I was treating only 180°,” he said. “Two years ago I moved to 360° treatment featuring 120 spots, which has a stronger effect on IOP reduction.” Depending on the pigmentation, Ansari starts with 0.6mJ and increases the energy by incremental steps of 0.1 mJ until the production of bubbles is noted. He then reduces the energy by 0.1mJ. “For highly pigmented meshwork, I keep the same level of energy 0.4 mJ for all the treatment, because in these cases the risk of pressure spikes is higher,” he said.

Ansari performs a follow-up visit at four weeks to check IOP, and then conducts a second check at three or six months, depending on the clinical situation. He explained, “Long-term patient follow up is always necessary to check the durability of the treatment, and to perform a re-treatment if necessary.”

Ansari reported that some patients become anxious at the mention of ‘laser’ and elect a different treatment option. For this reason, he said, “It is important to choose the right words to explain the procedure to your patients.” He also commented that patient education materials, such as patient leaflets, play a vital role in helping better educate patients on the benefits of SLT.

Ansari sees 20 new glaucoma patients each week at four ophthalmic clinics, and is setting up a dedicated SLT clinic. Given that the treatment lasts no longer than a slit lamp examination, he feels it is a more efficient use of his time if he can treat several patients in one sitting. “As more glaucoma specialists become familiar with this treatment, the number of procedures will explode,” he said. “As far as I'm concerned, all glaucoma specialists should have an SLT system.”

Ansari is currently conducting a short-term trial comparing the efficacy and overall cost of medication and SLT in primary open-angle glaucoma, and has discussed his preliminary results at the EVER congress in Vilamoura, Portugal in October 2006. He reported that preliminary results on 120 patients showed a 25 percent reduction in IOP and a 75 percent reduction of the number of drugs taken.

Ellex Presents SLT Symposium During ESCRS

During the recent 24th Congress of the European Society of Cataract and Refractive Surgeons (ESCRS), Ellex raised awareness of SLT through a special symposium. Titled "Selective Laser Trabeculoplasty: When to Use it and Why," the Ellex symposium featured a panel of international speakers, led by U.K. Research Professor of Ophthalmology, John Marshall. Other members of the panel included Professor Shlomo Melamed from Israel, Professor Isabelle Riss of France and Madhu Nagar from the United Kingdom. It was hosted as part of the EuroTimes Satellite Education Program.

Highlights

According to two studies presented during the Ellex symposium, SLT is effective as both a primary and secondary treatment for patients with ocular hypertension or primary open-angle glaucoma (POAG).

To outline the benefits of SLT as both a secondary and adjunctive treatment, Professor Riss focused on results from her study of 60 patients with ocular hypertension and glaucoma. Two patients had been operated on previously, and a further two patients were aphakic. The mean age was 67 years (range 14 to 75 years). SLT treatment focused on the pigmented trabecular meshwork at an energy level of 0.7 mJ per pulse. The energy level was reduced for heavily pigmented eyes.

Riss concluded with what she sees as the main benefits of SLT as an adjunctive treatment: a reduction in IOP of between 20-40 percent, generally seen six weeks postoperatively, as well as few side effects, treatment repeatability and a solution for patients who are intolerant to topical medications.

Professor Melamed outlined the results of a prospective, non-randomized study investigating SLT as a primary treatment for POAG in 45 eyes of 31 patients. Based on the results of this study, Professor Melamed concluded that SLT is an effective and safe option for the primary treatment of OAG.

Both Melamed and Riss agreed that SLT offers significant benefits over argon laser trabeculoplasty (ALT). Melamed spoke of the "circle of destruction" that is caused by ALT, and Riss pointed to the fact that it takes considerably longer to discover the negative effects of ALT treatment. Also, unlike ALT, SLT treatment can be repeated more than twice. They concluded that although ALT and SLT offer statistically similar IOP reductions, SLT provides a much safer option.

Ms. Madhu Nagar presented results from a retrospective analysis of case notes from consecutive SLT procedures conducted between January 2000 and December 2005. A total of 546 eyes of 315 patients underwent the procedure. Of these, 80 percent had POAG, and the remaining 20 percent

had ocular hypertension. 279 eyes (51 percent) received SLT as a primary treatment, 267 (49 percent) as an adjunctive treatment and 89 eyes underwent SLT re-treatment or enhancement (only 61 of these case notes were analyzed).

In the primary group, a 33 percent mean reduction in IOP was recorded. In the secondary group, this figure was 32.6 percent, and for those receiving SLT as a re-treatment, there was a 29 percent drop in IOP. The number of eye drops used fell from 1.8 preoperatively

According to two studies presented during the Ellex symposium, SLT is effective as both a primary and secondary treatment for patients with ocular hypertension or primary open-angle glaucoma (POAG).



to 0.86 postoperatively. Nagar highlighted that SLT offers significant reductions in IOP and reduces the number of topical medications required. Her confidence in the procedure has led to SLT being offered as a standard treatment at her clinic.

Professor Marshall concluded the session with the observation that SLT has a diverse role to play in glaucoma management,

and is an excellent tool for the ophthalmologist. "SLT takes pressure control out of the hands of the patient and puts it back in the hands of the ophthalmologist, who can choose when best to apply it for each individual patient," he said.

About the Panel



John Marshall, Isabelle Riss, Shlomo Melamed, Madhu Nagar

John Marshall

Professor Marshall is an internationally recognized expert in ophthalmology. Graduating from London University in 1965, he received his PhD in 1968. For the past 30 years, he has pursued the development of lasers in ophthalmology, helping develop the Excimer laser for correcting refractive disorders and the first diode laser for treating eye complications among patients with diabetes, glaucoma and age-related macular degeneration.

Madhu Nagar

Ms Madhu Nagar is a consultant ophthalmologist at the Clayton Eye Center, UK, and specializes in glaucoma management. A leading proponent of SLT, Nagar has undertaken several studies investigating the efficacy of SLT as a treatment for glaucoma, and has over six years' experience using SLT

Shlomo Melamed

Professor Melamed is director of the Sam Rothberg Glaucoma Center and Professor of Ophthalmology at Tel Aviv University Medical School, Israel. Melamed has also played an instrumental role in advancing the understanding of glaucoma management through founding the International Glaucoma Symposium (IGS). Melamed has undertaken clinical studies on the biology and mechanisms of SLT, many of which were used as the basis for the development of SLT.

Isabelle Riss

Professor Riss, who was one of the first users of SLT in France, is in charge of the Department of Ophthalmology at Pellegrin Hospital in Bordeaux. Her interest in SLT technology stemmed from the lack of clinical solutions between medical and surgical treatment options for glaucoma. Through her work with Elie Dahan of South Africa and André Mermoud of Switzerland, she has greatly contributed to the development of new surgical techniques in glaucoma.

Clinical Case Spotlight: The Diverse Role of SLT

Ms Madhu Nagar, FRCS Ophth, MS Ophth

Case 1

Ocular Hypertension

A 71-year-old male with bilateral raised IOP was seen in our clinic in July 1999, after being referred by his optometrist.

Clinical Findings:

- Visual acuity was 6/6 in both eyes
- IOP was 24 and 26mmHg, right and left, respectively
- Gonioscopy revealed bilateral open angles
- Fundus examination showed bilaterally healthy optic discs with a C:D ratio of 0.4:1.

Past Medical History:

A history of hypertension, angina and coronary artery bypass grafting (in 1992).

Family History:

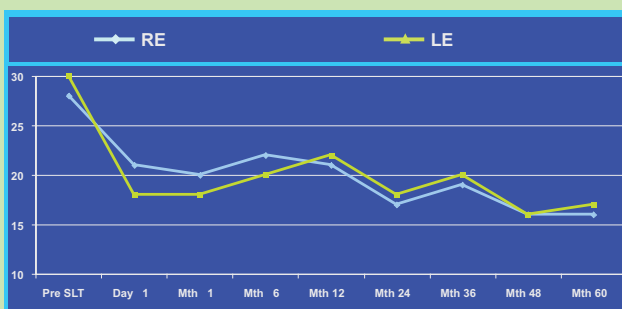
Positive for open angle glaucoma.

The plan was to review the patient in clinic in three months, using a glaucoma-specific visual field test before deciding on a management plan.

In October, visual fields were found to be normal, but IOP levels had risen to 28 and 30mmHg, right and left, respectively. All other findings were the same as the previous visit.

In view of his risk factors – a relevant past medical history, a positive family history and raised IOP – available management treatment options (medical or laser) were discussed with the patient. Later that month, uneventful bilateral SLT was performed to lower IOP. The patient has been followed up in clinic for the past five years; to date, the reduction in IOP has been maintained at 16mmHg right and 17mmHg left. The patient is still on no medical treatment, VA and visual fields are normal and optic discs remain healthy.

Graph representing IOP measurement prior to SLT and five years post-SLT



Case 2

Pigment Dispersion Syndrome

A 55-year-old female with raised IOP in her left eye was presented in clinic in January 2000.

Clinical Findings:

- Visual acuity was 6/7.5 right and 6/6 left
- IOP was 12mmHg right and 24mmHg left
- Gonioscopy revealed bilateral open angles with hyperpigmentation
- Fundus examination showed bilaterally healthy optic discs with a C:D ratio of 0.4:1 right eye and 0.3:1 left eye
- Visual fields: both eyes within normal limits

Family History:

Positive for glaucoma

Past Ocular History:

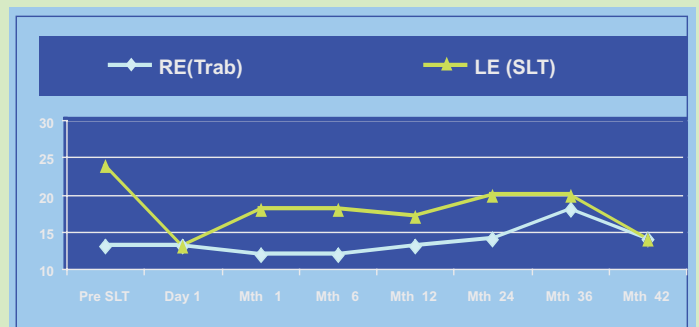
Right trabeculectomy in November 1989

In view of angle appearance on gonioscopy, high left IOP and positive family history, a diagnosis of bilateral pigment dispersion syndrome was made and treatment options to lower left IOP were discussed with the patient.

Left SLT was performed in May 2000, achieving a remarkable 48 percent IOP reduction on day one.

The patient has been followed up in clinic for the past 56 months, and to date, this reduction in left IOP has been maintained; IOPs are 13mmHg both right and left. The patient is still on no medical treatment, VA and visual fields are normal and optic discs remain healthy.

Graph representing IOP measurement LE prior to SLT and 56 months post SLT





*Madhu Nagar
FRCS Ophth, MS Ophth*

*Consultant Ophthalmologist
Clayton Eye Centre
Wakefield
West Yorkshire*

Case 3

SLT in Traumatic Glaucoma

A 41-year-old male with raised right IOP was seen in clinic in February 2002 after being referred by his optometrist.

Clinical Findings:

- Visual acuity was 6/6 in both eyes
- IOP was 38mmHg right and 20mmHg left
- Gonioscopy revealed inferior angle recession in the right eye with fibrosis of the trabecular meshwork
- Fundus examination showed bilaterally healthy optic discs with a C:D ratio of 0.5:1 right eye and 0.3:1 left eye
- Visual fields were normal in both eyes

Family History:

Negative for glaucoma

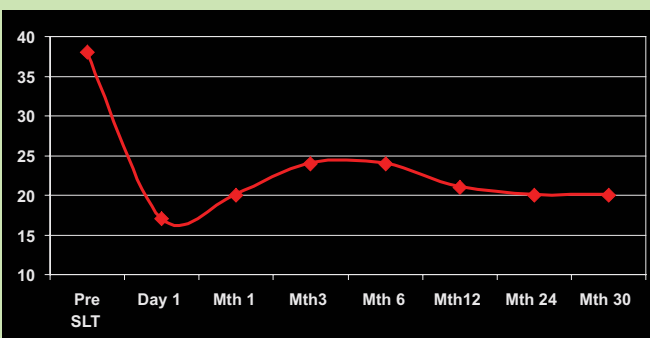
Past Ocular History:

Blunt ocular trauma in the right eye eight years ago

In view of the angle appearance under gonioscopy, the significantly raised right IOP and the history of trauma, a diagnosis of right eye angle recession glaucoma was made. Treatment options were considered, and SLT was performed later that month to lower the IOP in the right eye.

From the graph below, it can be seen that IOP fell from 38mmHg to 16mmHg one day after SLT. The patient has been followed up in clinic for the past 30 months, and this reduction has been maintained, with the last recorded IOP at 20mmHg. The patient remains on no anti-glaucoma medication, VA and visual fields are stable and optic discs remain healthy.

Graph representing IOP measurement RE prior to SLT and 30 months post SLT



Case 4

Secondary Glaucoma

An 84-year-old female, already under the care of the eye department, was being reviewed in clinic.

Past Ocular History:

A history of complicated cataract surgery in the right eye with an iris clip IOL in 1986.

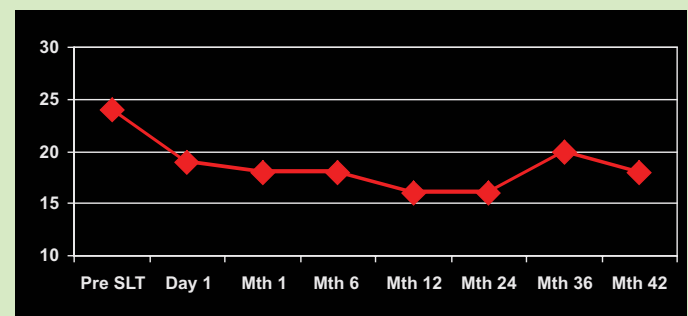
Post-operatively, the patient developed secondary glaucoma in this eye, and IOP was noted as 28mmHg right and 16mmHg left. A prescription of gutt Timolol 0.5% bd and gutt Pilogel were prescribed to the right eye to lower IOP.

The patient was reviewed in clinic regularly and doing well; however, after a period of 7-8 years IOP in the right eye rose to 22mmHg. The left eye remained at 18mmHg. This time, a prescription of gutt Timolol 0.5% bd and gutt Alphagan was administered in the right eye and succeeded in lowering the IOP to 18mmHg.

Again, however, in April 2000, the IOP in the right eye rose to 24mmHg. The left remained at 18mmHg. In view of the repeated and frustrating rises in the right IOP, it was decided that SLT was an option to help stabilize IOP and hopefully eliminate, or at least reduce, the number of drops needed.

Right SLT was performed later that month and IOP fell to 19mmHg. The patient has been reviewed regularly in clinic, and 42 months post-SLT, the right IOP remains low at 18mmHg. There is no change in VA, visual fields or optic disc appearances. The patient is now only using gutt Timolol 0.5% bd.

Graph representing IOP measurement RE prior to SLT and 42 months post SLT



Events

Symposia

**Thai Ophthalmology Society
Annual Congress
SLT Roundtable Discussion
and Lecture**

November 23-24 2006, Bangkok, Thailand

**Russian Glaucoma Society
Meeting**

December 1 2006, Moscow, Russia

Taiwan SLT Lecture

December 10 2006, Taipei, Taiwan

German SLT Symposium

February 15 2007, Düsseldorf, Germany

**IGS SLT Symposium
SLT: Today and Tomorrow
6th International Glaucoma
Symposium (IGS)**

March 28-31 2007, Athens, Greece

**WGC SLT Symposium
World Glaucoma Congress**

July 18-21 2007, Singapore

Congresses

**38th Royal Australian and
New Zealand College of
Ophthalmology (RANZCO)
Meeting**

November 5-8 2006, Sydney, Australia

**American Academy of
Ophthalmology (AAO)**

November 11-14 2006, Las Vegas, USA

**South East Asian Glaucoma
Interest Group (SEAGIG)**

December 1-3 2006, Chennai, India

**22nd Asia Pacific Academy of
Ophthalmology**

February 24-28 2007, Lahore, Pakistan

User Group, *continued*

Goldberg, a clinical associate professor at the University of Sydney, chaired the meeting.

Among the many topics discussed were treatment protocols. As they compared notes, user group members found that they all apply lopicidine and Alphagan. The majority of members commence treatment at 0.6 – 0.7mJ energy, depending on the patient's pigmentation level, and increase the energy level in 1mJ increments until bubble formation is observed. Some members preferred to see cavitation bubbles all of the time, while others aimed for bubbles during 50 percent of treatment. About half follow the standard protocol of subthreshold, but more experienced users utilize higher energy settings.

Members were interested in learning how high energy could be set before causing damage, with several indicating an unwillingness to go higher than 1.2mJ, even if there is no cavitation bubble formation.

SLT outcomes were also discussed. Overall, the group agreed that SLT works for a number of varying patient requirements: as an effective treatment option for OAG patients, for controlling IOP, and for reducing existing medications and making new ones unnecessary.

Several members were also curious about the efficacy of SLT as a primary treatment, and were eager to review further results. Dr. Goldberg advised them that SLT is like any laser trabeculoplasty procedure, in that it is best used for earlier glaucoma cases, compared to more advanced and complicated ones.

Finally, the meeting attendees agreed that more patient education is required for the general public, and that the Ellex Value-Added SLT program will be a valuable resource to equip doctors with educational tools. Details about upcoming meetings of the newly formed user group will be communicated as they become available.

correction. In the July issue of *Regenerate* we reported on Dr. Yasuaki Kuwayama's data comparing 360-degree SLT with 180-degree SLT that was presented at APAO 2006. The article incorrectly stated that Dr. Kuwayama's results found no statistically significant difference between the two regimes. However, his results suggest that although both 180- and 360-degree treatments significantly reduced IOP, the efficacy of 360-degree treatment was significantly greater than 180-degree treatment.

Register to receive this newsletter

Welcome to the Ellex SLT newsletter, *Regenerate* - a customer-focused initiative dedicated to sharing information on SLT.

Through *Regenerate*, Ellex will provide insights on SLT covering literature reviews and clinical study updates, drawing on the expertise of experienced SLT users and the Ellex clinical advisory network.

Regenerate will be published quarterly, and can be received via email.

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Japan

4-3-7 Miyahara 4F
Yodogawa-ku Osaka
532-0003 JAPAN
+81 6 6396 2250