

Video-assisted Thoracoscopic Sympathectomy for the Treatment of Facial Blushing: Ultrasonic Scalpel Versus Diathermy

M.A. Callejas, M. Rubio, M. Iglesias, J. Belda, E. Canalís, M. Catalán, and J.M. Gimferrer

Servei de Cirurgia Toràctica, Institut Clínic de Pneumologia i Cirurgia Toràctica, Hospital Clínic i Universitari, Barcelona, Spain.

OBJECTIVE: To evaluate the advantages of the ultrasonic scalpel compared to electrocoagulation in patients undergoing video-assisted thoracoscopic sympathectomy or sympathectomy for uncontrolled facial blushing.

METHODS: Two hundred bilateral video-assisted thoracoscopic procedures to interrupt transmission in the thoracic sympathetic nerve were performed in 100 patients with incapacitating facial blushing. In 2 cases, the video-assisted approach was chosen because of pleural symphysis. The mean age of patients was 34 years (range: 15 to 67). The sympathetic chain was interrupted from the lower portion of the first thoracic ganglion through the third.

RESULTS: All patients were discharged within 24 hours with the exception of one on whom an emergency thoracotomy had been performed. No complications were reported in the group in which a harmonic scalpel was used. One case of temporary Horner syndrome (4 months) and 3 cases of persistent chest pain (more than 2 weeks) were reported in the diathermy group. There were 9 cases of partial and asymptomatic pneumothorax that resolved without treatment or prolonged hospital stays.

CONCLUSION: Dissection of the sympathetic nerve is accomplished more reliably and with better visualization with the ultrasonic scalpel. Peripheral lesions in lung parenchyma and adjacent tissues (intercostal vessels and nerves) are avoided, as is Horner syndrome, which can be caused by dispersion of heat. Use of the ultrasonic scalpel would also lead to a lower incidence of postoperative neuralgia.

Key words: Facial blushing. Video-assisted thoracoscopic sympathectomy and sympathectomy. Ultrasonic scalpel.

Simpatectomía torácica por videotoracoscopia para el tratamiento del rubor facial: bisturí ultrasónico frente a diatermia

OBJETIVO: Valorar las ventajas de la utilización del bisturí ultrasónico frente a la electrocoagulación, en los pacientes operados de rubor facial incontrolable mediante simpaticólisis o simpaticotomía torácica por videotoracoscopia.

MÉTODO: Se han realizado 200 interrupciones del simpático torácico bilaterales por videotoracoscopia en 100 pacientes afectados de rubor facial invalidante. Dos de ellas se realizaron mediante cirugía videoasistida por presentar sínfisis pleural. La edad media de los pacientes fue de 34 años (rango: 15-67). La cadena simpática fue interrumpida desde la porción inferior de T1 hasta T3 inclusivos.

RESULTADOS: Todos los pacientes fueron dados de alta en 24 h, a excepción del paciente en el que se realizó toracotomía de asistencia. En el grupo en que se utilizó el bisturí armónico no hubo complicaciones. En el grupo de diatermia hubo un caso de síndrome de Horner transitorio (4 meses) y tres casos de dolor torácico persistente (superior a dos semanas). En total, hubo 9 neumotórax parcelarios y asintomáticos que no requirieron tratamiento ni prolongaron la estancia hospitalaria.

CONCLUSIONES: El bisturí ultrasónico permite una sección del simpático más firme y con mejor visualización. Evita lesiones periféricas en el parénquima pulmonar y tejidos adyacentes (vasos y nervios intercostales), así como el síndrome de Horner que se puede producir por efecto calorífico. Produciría también una menor incidencia de neuralgias posquirúrgicas.

Palabras clave: Rubor facial. Simpaticotomía y simpaticólisis torácica por videotoracoscopia. Bisturí ultrasónico.

Introduction

Facial blushing was described as a disabling condition by Charles Darwin in 1872.¹ Sudden, uncontrollable facial blushing can be directly attributed

to the vasodilatory action of a circulating histamine-like substance, or it may reflect changes in neurological control of cutaneous blood flow in the affected areas. Neurological control of vascular tone is predominately carried out by autonomic vasodilator nerve fibers that cause vasoconstrictor tone to relax in the face, neck and upper chest where blushing is most frequent. Such fibers can be present in somatic nerves that reach the skin, including the trigeminal nerve. Autonomic nerve fibers can also innervate sweat glands and activate sweating along with blushing as opposed to blushing without

Correspondence: Dr. M.A. Callejas.
Servei de Cirurgia Toràctica, Institut Clínic de Pneumologia i Cirurgia Toràctica.
Hospital Clínic i Universitari.
Villarroel, 170. 08036 Barcelona, España.
E-mail: 7891mcp@comb.es

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sweating in which there is a mediating vasodilator. The presence or absence of sweating has been proposed as a guide to explain blushing mechanisms. Blushing intensity can be scored by measuring malar temperature and can also serve as an outcome measure for assessing treatment.²

Interruption of the sympathetic chain by endoscopic surgery is a well-established treatment for uncontrolled facial blushing.³ Wittmoser⁴ was the first to report its beneficial effect on blushing in 1985. However, this technique may be associated with some sequelae. Horner syndrome after sympathetic chain interruption currently has a variable incidence and can reach 6.9%.⁵ Another post-operative complication is intercostal neuralgia with an incidence between 0% and 32%.^{6,7}

The objective of this study was to evaluate post-operative complications of video-assisted thoracoscopic sympathectomy using a harmonic scalpel compared to procedures using video-assisted thoracoscopic sympathectomy by electrocoagulation in patients undergoing surgery for uncontrolled facial blushing.

Methods and Patients

Two hundred bilateral video-assisted thoracoscopic interruptions of the sympathetic chain were performed on 100 patients with uncontrolled facial blushing from March 2001 to November 2002. Two of them were performed by means of video-assisted surgery because of pleural symphysis, and they were carried out using an ultrasonic scalpel. Procedures were sequentially staged using general anesthesia and selective intubation with patients in lateral decubitus position. The mean age of patients was 34 years (range: 15 to 67). The sympathetic chain was interrupted from the lower portion of the first thoracic sympathetic ganglion (T1) through T3. The Kuntz nerve was looked for (until T4) and, if present, was sectioned. Two groups of patients were studied. In the first group (80 patients), 5 mm optics and trocars were used, and sympathetic transection was carried out with an ultrasonic scalpel at 55 000 Hz (AutoSonix System, United States Surgical, Division of Tyco Healthcare LP, USA). In the other group (20 patients), 2.5 mm optics and trocars were used and sympathectomy was performed by means of 25 W unipolar diathermy.

Results

All patients, except the one in whom video-assisted double thoracotomy was performed, were discharged within 24 hours. No complications developed in the group in which the ultrasonic scalpel was used. In the diathermy group there was 1 case of temporary Horner syndrome (4 months) and 3 cases of persistent chest pain (more than 2 weeks) that corresponded to T2 and

T3 dermatomes (Table). Nine cases of partial and asymptomatic pneumothorax requiring neither treatment nor prolonged hospital stays were reported. A Student t test ($P < .05$) showed no significant difference in operative time between groups.

Discussion

Thoracic sympathectomies¹⁰ and sympathectomies¹¹ have increased dramatically in recent years with the appearance and subsequent development of video-assisted thoracoscopy.^{8,9} This technique has been used to treat a variety of complaints, the most frequent being localized hyperhidrosis and facial blushing,^{3,13} for which results are excellent and morbidity low.

Severe, disabling compensatory hyperhidrosis, although rare, is difficult to treat and is one of the main causes of postoperative dissatisfaction.¹⁵ Remaining complications are either not severe (pneumothorax, chest pain) or are exceptional (Horner syndrome, hemothorax, and gustatory sweating). In our series there were 9 (9%) cases of pneumothorax in the diathermy group (Table). All of them were unilateral and, in contrast to other series,¹⁶ none required pleural drainage or a longer hospital stay. Endeavors to perfect endoscopic techniques¹⁷ and the introduction of new techniques for sympathetic interruption¹⁸ may improve upon these results. In fact, some authors suggest that the introduction of 2 mm instruments not only improves esthetics, but also minimizes injury to the intercostal neurovascular bundle and decreases the incidence of postoperative pain.¹⁹ Applying metal clips to interrupt the sympathetic chain by compression, introduced by Lin et al²⁰ and also performed by other authors,²¹ allows intervention reversal for those cases in which reflex sweating is intolerable. In this sense, the Lin-Telaranta classification²² may provide a new therapeutic approach for certain sympathetic disorders.

Experimental development of the ultrasonic scalpel began in 1994²³ and was first applied clinically in general surgery and gynecology in 1996.^{24,25} It was later used in cardiac surgery.²⁶ Various applications in chest surgery have been described, especially in video-assisted thoracoscopy.^{27,28} Because the ultrasonic scalpel generates no smoke, the operative field is improved, allowing a more reliable transection, particularly in thoracic sympathetic surgery. Furthermore, fewer peripheral lesions in lung parenchyma and adjacent tissues (intercostal vessels and nerves) are caused. Horner syndrome, which is probably produced by heat dispersion, is theoretically avoided, and the incidence of postoperative neuralgia is also reportedly lower.²⁹

TABLE

Postoperative Complications After Both Procedures Used

	Ultrasonic Scalpel	Diathermy
Horner syndrome	0	1 (1%)
Persistent chest pain	0	3 (3%)
Pneumothorax	0	9 (9%)

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