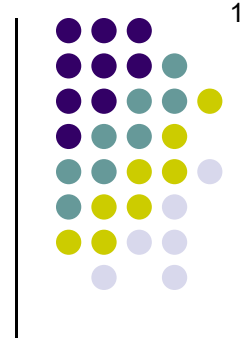


Q

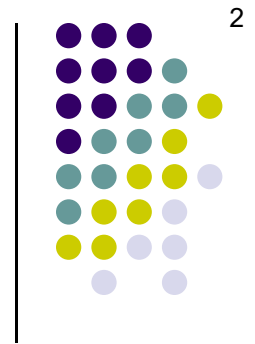
Optic Nerve Sheath Fenestration



Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?

A

Optic Nerve Sheath Fenestration



Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Q

Optic Nerve Sheath Fenestration



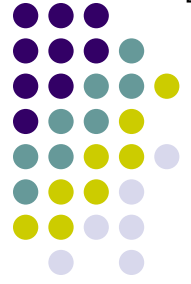
3

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Is ONSF an effective intervention in...
--Idiopathic intracranial hypertension (IIH)?

A

Optic Nerve Sheath Fenestration

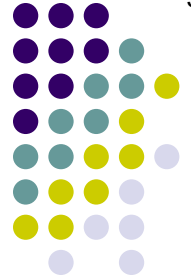


Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
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Is ONSF an effective intervention in...
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Q

Optic Nerve Sheath Fenestration



5

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
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Is ONSF an effective intervention in...

--*Idiopathic intracranial hypertension (IIH)?* **Yes**

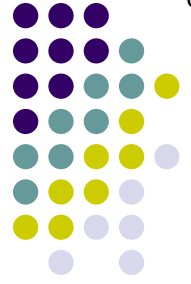
--*Cryptococcal meningitis?*

----**Yes** if vision loss is due to...

----**No** if loss is due to...

A

Optic Nerve Sheath Fenestration



Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
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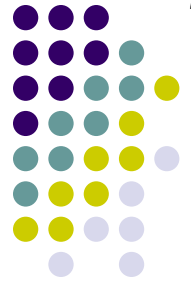
--*Cryptococcal meningitis?*

----**Yes** if vision loss is due to...increased ICP

----**No** if loss is due to...optic nerve invasion

Q

Optic Nerve Sheath Fenestration



7

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Is ONSF an effective intervention in...

--Idiopathic intracranial hypertension (IIH)? **Yes**

--Cryptococcal meningitis?

----**Yes** if vision loss is due to...increased ICP

----**No** if loss is due to...optic nerve invasion

--Traumatic optic neuropathy?

A

Optic Nerve Sheath Fenestration



Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
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Is ONSF an effective intervention in...

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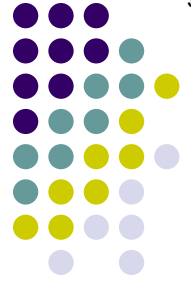
----**Yes** if vision loss is due to...increased ICP

----**No** if loss is due to...optic nerve invasion

--Traumatic optic neuropathy? **Yes**, if vision loss is progressive

Q

Optic Nerve Sheath Fenestration



9

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Is ONSF an effective intervention in...

--*Idiopathic intracranial hypertension (IIH)?* **Yes**

--*Cryptococcal meningitis?*

----**Yes** if vision loss is due to...increased ICP

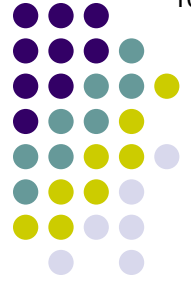
----**No** if loss is due to...optic nerve invasion

--*Traumatic optic neuropathy?* **Yes**, if vision loss is progressive

--*Nonarteritic anterior ischemic optic neuropathy (NAION)?*

A

Optic Nerve Sheath Fenestration



Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Is ONSF an effective intervention in...

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----**Yes** if vision loss is due to...increased ICP

----**No** if loss is due to...optic nerve invasion

--*Traumatic optic neuropathy?* **Yes**, if vision loss is progressive

--*Nonarteritic anterior ischemic optic neuropathy (NAION)?* **Oh hell no!**

Q

Optic Nerve Sheath Fenestration



11

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

Is ONSF an effective intervention in...

--Idiopathic intracranial hypertension (IIH)? **Yes**

--Cryptococcal meningitis?

----**Yes** if vision loss is due to...increased ICP

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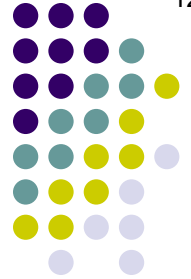
--Traumatic optic neuropathy? **Yes**, if vision loss is progressive

--Nonarteritic anterior ischemic optic neuropathy (NAION)? **Oh hell no!**

What is the name of the study that looked at ONSF in NAION?

A

Optic Nerve Sheath Fenestration



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Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

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What is the name of the study that looked at ONSF in NAION?

The **Ischemic Optic Neuropathy Decompression Trial (IONDT)**



Q

Optic Nerve Sheath Fenestration

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
Progressive loss of visual function secondary to increased intracranial pressure (ICP) resulting in papilledema

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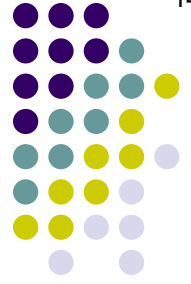
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The **Ischemic Optic Neuropathy Decompression Trial (IONDT)**

What's up with the 'Oh hell no!'? What did the IONDT find that was so bad?



A

Optic Nerve Sheath Fenestration

Generally speaking (ie, not specific clinical entities), what is the indication for ONSF?
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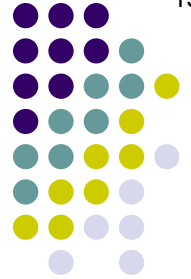
The **Ischemic Optic Neuropathy Decompression Trial (IONDT)**

What's up with the 'Oh hell no!'? What did the IONDT find that was so bad?

It found that not only was ONSF ineffective in ameliorating vision loss in NAION, it actually **increased** the risk of vision loss--the results were so bad, the study was **stopped early**

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

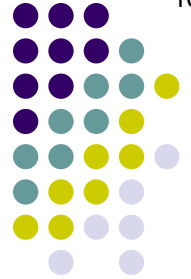


Q

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?





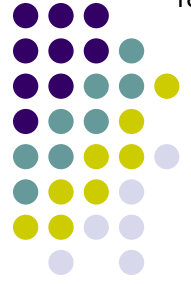
A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five



Optic Nerve Sheath Fenestration

Q

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five surgical spaces of the orbit?

-
-
-
-
-



A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

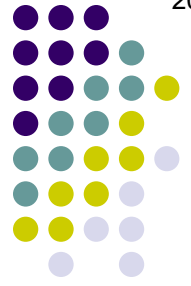
What are the five surgical spaces of the orbit?

- Subperiosteal
- Sub-Tenon's
- Extraconal
- Intraconal
- Subarachnoid

Q

Optic Nerve Sheath Fenestration

20



Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five spaces?

--**Subperiosteal**

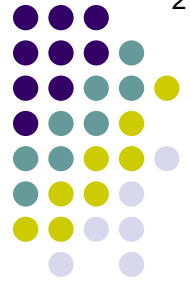
--Sub-Tenon's

--Extraconal

--Intraconal

--Subarachnoid

Where is the subperiosteal space?



A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five spaces?

--**Subperiosteal**

--Sub-Tenon's

--Extraconal

--Intraconal

--Subarachnoid

Where is the subperiosteal space?

Between the bone and its periosteal lining



Q

Optic Nerve Sheath Fenestration

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How many so-called 'surgical spaces' are there within the orbit?

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What are the five spaces?

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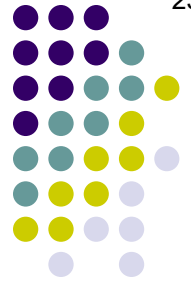
--Intraconal

--Subarachnoid

Where is the subperiosteal space?

Between the bone and its periosteal lining

in what clinical situation is the subperiosteal space often of critical import?



A

Optic Nerve Sheath Fenestration

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Orbital cellulitis



Q

Optic Nerve Sheath Fenestration

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What are the five spaces?

--**Subperiosteal**

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--Extraconal

--Intraconal

--Subarachnoid

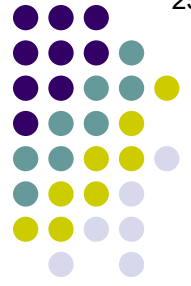
Where is the subperiosteal space?

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in what clinical situation is the subperiosteal space often of critical import?

Orbital cellulitis

What is the potential role of the subperiosteal space in orbital cellulitis?



A

Optic Nerve Sheath Fenestration

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Between the bone and its periosteal lining

in what clinical situation is the subperiosteal space often of critical import?

Orbital cellulitis

What is the potential role of the subperiosteal space in orbital cellulitis?

It is the space in which an abscess may be located--an abscess that may necessitate surgical drainage for the infection to resolve



Q

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five surgical spaces of the orbit?

--Subperiosteal

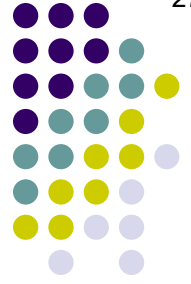
--**Sub-Tenon's**

--Extraconal

--Intraconal

--Subarachnoid

Where is sub-Tenon's space?



A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five surgical spaces of the orbit?

--Subperiosteal

--**Sub-Tenon's**

--Extraconal

--Intraconal

--Subarachnoid

Where is sub-Tenon's space?

Between Tenon's capsule and the globe



Q

Optic Nerve Sheath Fenestration

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What are the five surgical spaces of the orbit?

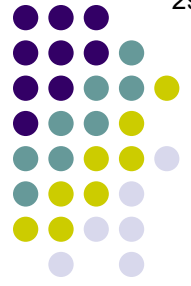
--Subperiosteal

--Sub-Tenon's (ie, between Tenon's capsule and the globe)

--Extra**conal** *What structures comprise the orbital 'cone'?*

--Intra**conal**

--Subarachnoid (ie, between the optic nerve's dural sheath and the nerve proper)



A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

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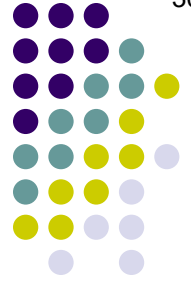
--Subperiosteal

--Sub-Tenon's (ie, between Tenon's capsule and the globe)

--Extra**conal** *What structures comprise the orbital 'cone'?*

--Intra**conal** *The rectus muscles, along with the intermuscular septa connecting them*

--Subarachnoid (ie, between the optic nerve's dural sheath and the nerve proper)



Q

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

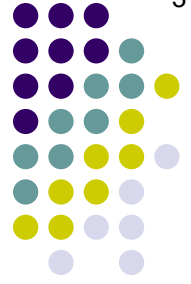
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Five

What are the five surgical spaces of the orbit?

- Subperiosteal
- Sub-Tenon's
- Extraconal
- Intraconal
- Subarachnoid**

Where is the (orbital) subarachnoid space located?



A

Optic Nerve Sheath Fenestration

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How many so-called 'surgical spaces' are there within the orbit?

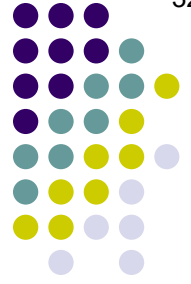
Five

What are the five surgical spaces of the orbit?

- Subperiosteal
- Sub-Tenon's
- Extraconal
- Intraconal
- Subarachnoid**

Where is the (orbital) subarachnoid space located?

Between the optic nerve's dural sheath and the nerve proper



Q

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five surgical spaces of the orbit?

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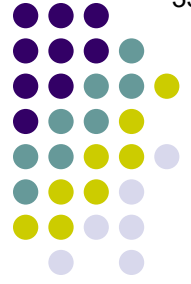
--Sub-Tenon's?

--Extraconal?

--Intraconal?

--Subarachnoid?

In which spaces is one working when performing an ONSF?



A

Optic Nerve Sheath Fenestration

Before we delve into ONSF, some preliminaries:

How many so-called 'surgical spaces' are there within the orbit?

Five

What are the five surgical spaces of the orbit?

--Subperiosteal

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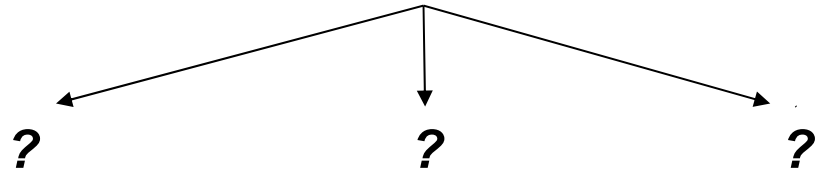
In which spaces is one working when performing an ONSF?
The intraconal, and sub-arachnoid



Optic Nerve Sheath Fenestration

Q

What three surgical approaches are used in ONSF?

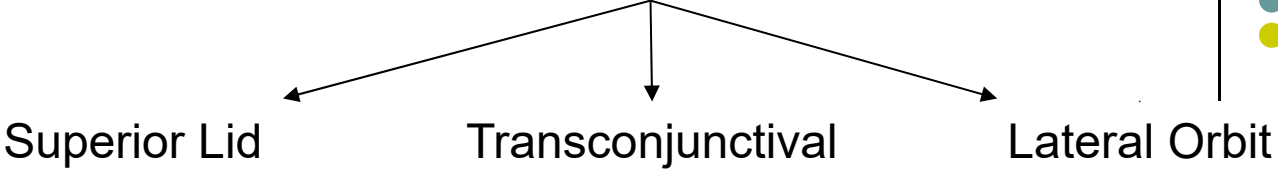




Optic Nerve Sheath Fenestration

A

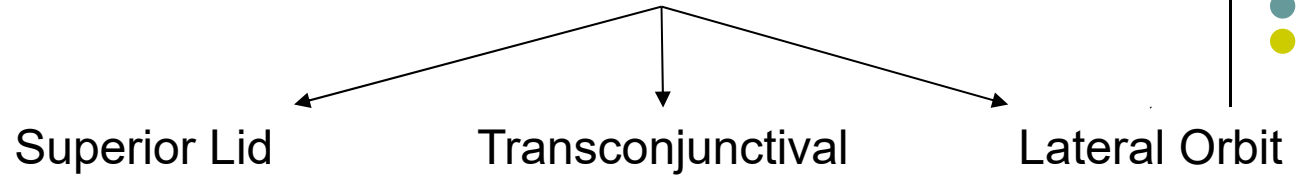
What three surgical approaches are used in ONSF?





Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?



Incision site

?

Q/A

Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?

Superior Lid

Transconjunctival

Lateral Orbit

Incision site

Medial lid crease

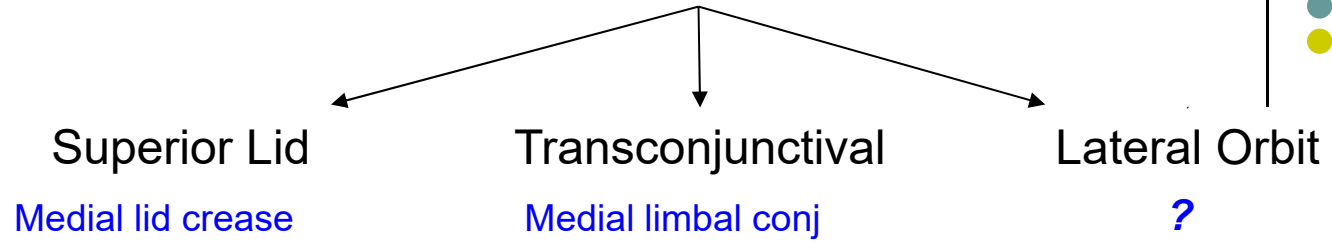
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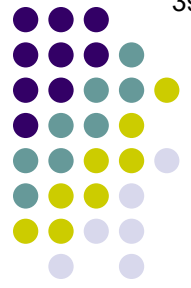
Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?



Q/A

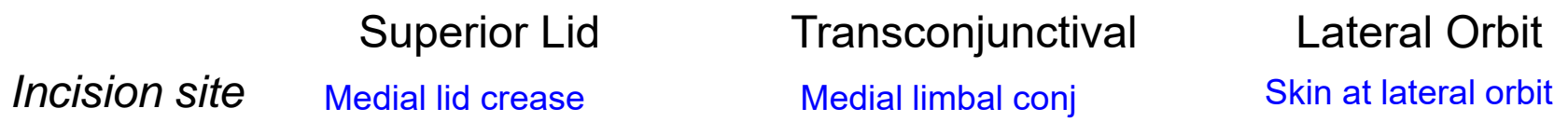
Incision site



Optic Nerve Sheath Fenestration

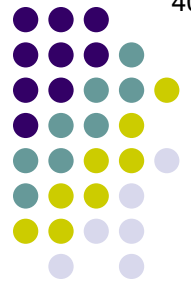
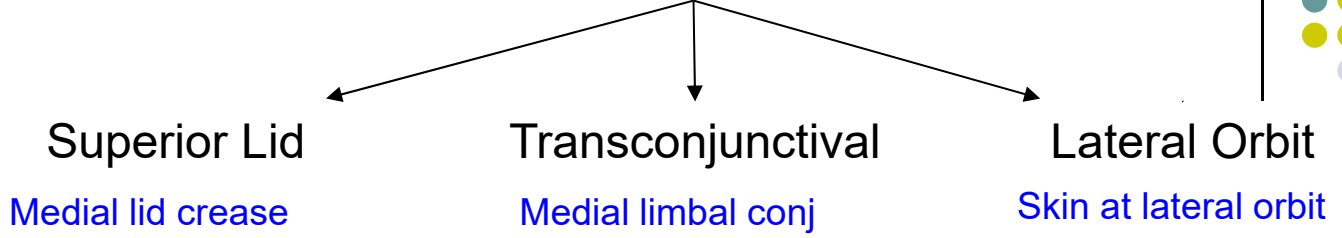
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Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?

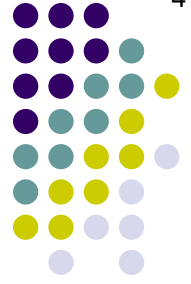


Q

Incision site

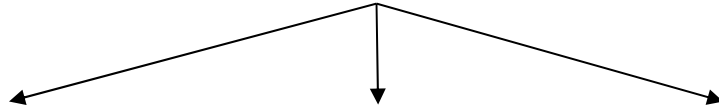
Approach in a nutshell

?



Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?



Superior Lid

Transconjunctival

Lateral Orbit

Incision site

Medial lid crease

Medial limbal conj

Skin at lateral orbit

Approach in a nutshell

Blunt dissection is carried posteriorly and inferolaterally. The septum connecting the SR and the MR is incised, providing access to the intraconal space.

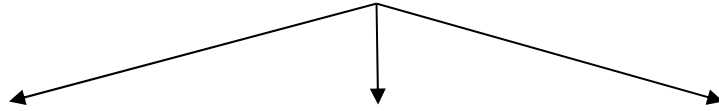
?



Optic Nerve Sheath Fenestration

Q/A

What three surgical approaches are used in ONSF?



Superior Lid

Transconjunctival

Lateral Orbit

Incision site

Medial lid crease

Medial limbal conj

Skin at lateral orbit

Approach in a nutshell

Blunt dissection is carried posteriorly and inferolaterally. The septum connecting the SR and the MR is incised, providing access to the intraconal space.

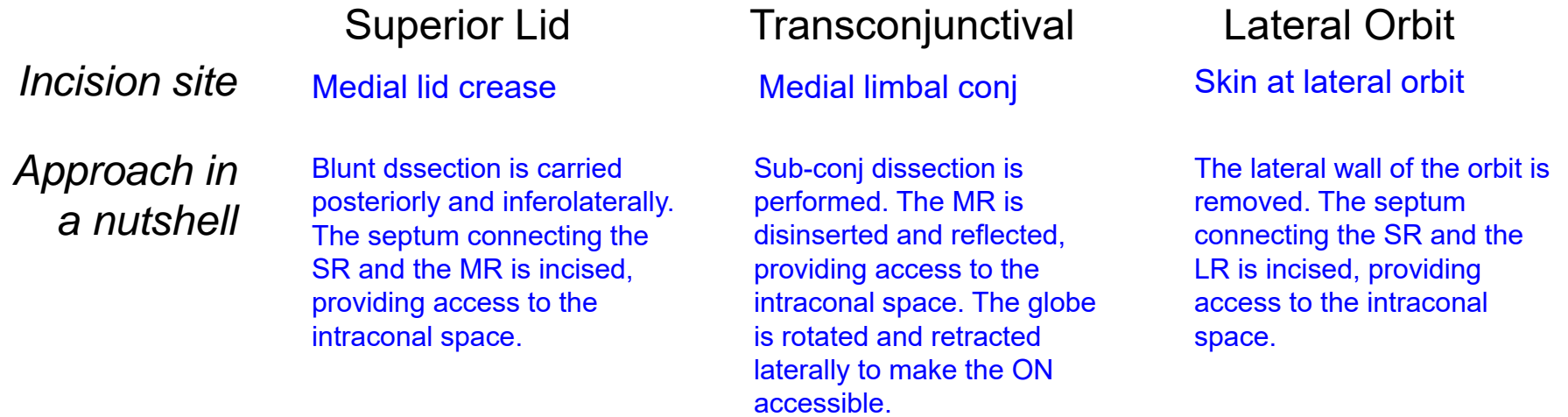
Sub-conj dissection is performed. The MR is disinserted and reflected, providing access to the intraconal space. The globe is rotated and retracted laterally to make the ON accessible.

?

Optic Nerve Sheath Fenestration

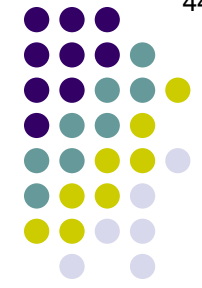
A

What three surgical approaches are used in ONSF?



Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?



Superior Lid

Transconjunctival

Lateral Orbit

Incision site

Medial lid crease

Medial limbal conj

Skin at lateral orbit

Approach in a nutshell

Blunt dissection is carried posteriorly and inferolaterally. The septum connecting the SR and the MR is incised, **providing access to the intraconal space.**

Sub-conj dissection is performed. The MR is disinserted and reflected, **providing access to the intraconal space.** The globe is rotated and retracted laterally to make the ON accessible.

The lateral wall of the orbit is removed. The septum connecting the SR and the LR is incised, **providing access to the intraconal space.**

Note that all three approaches get us where we need to go!

Optic Nerve Sheath Fenestration



Q

What three surgical approaches are used in ONSF?

Superior Lid

Transconjunctival

Lateral Orbit

Incision site

Medial lid crease

Medial limbal conj

Skin at lateral orbit

Approach in a nutshell

Blunt dissection is carried posteriorly and inferolaterally. The septum connecting the SR and the MR is incised, providing access to the intraconal space.

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The lateral wall of the orbit is removed. The septum connecting the SR and the LR is incised, providing access to the intraconal space.

Advantages

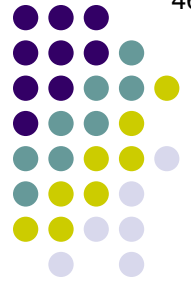
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Q/A

Optic Nerve Sheath Fenestration

What three surgical approaches are used in ONSF?

	Superior Lid	Transconjunctival	Lateral Orbit
<i>Incision site</i>	Medial lid crease	Medial limbal conj	Skin at lateral orbit
<i>Approach in a nutshell</i>	Blunt dissection is carried posteriorly and inferolaterally. The septum connecting the SR and the MR is incised, providing access to the intraconal space.	Sub-conj dissection is performed. The MR is disinserted and reflected, providing access to the intraconal space. The globe is rotated and retracted laterally to make the ON accessible.	The lateral wall of the orbit is removed. The septum connecting the SR and the LR is incised, providing access to the intraconal space.
<i>Advantages</i>	Least traumatic to orbital tissue	?	

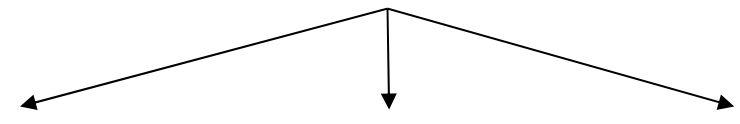




Q/A

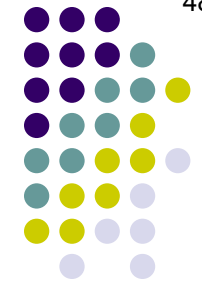
Optic Nerve Sheath Fenestration

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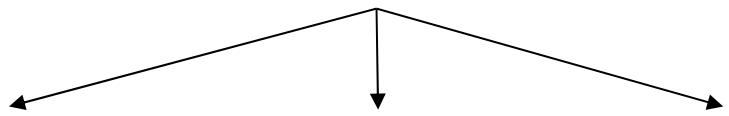
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<i>Advantages</i>	Least traumatic to orbital tissue	No skin incision	?

Optic Nerve Sheath Fenestration



A

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Lateral Orbit

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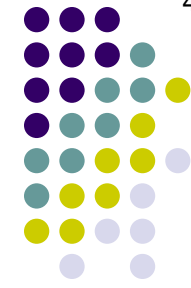
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Advantages

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No skin incision

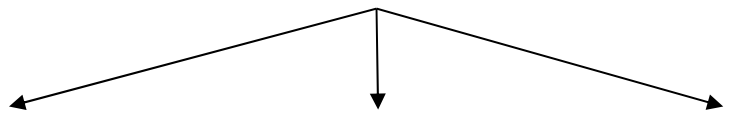
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Optic Nerve Sheath Fenestration

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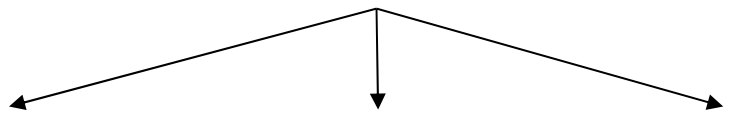
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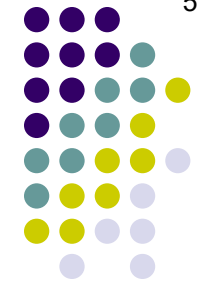
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Length of ON exposed

Disadvantages

Poorest ON exposure

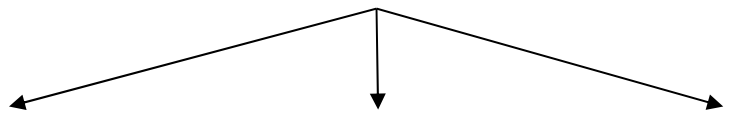
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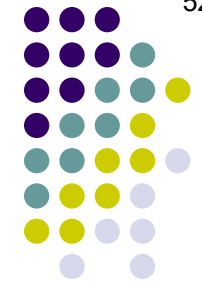
Extensive muscle and globe manipulation involved

?

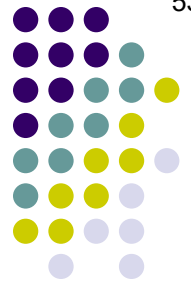
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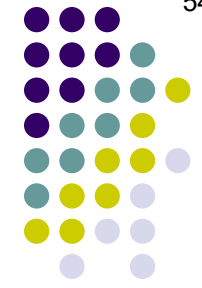
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What 'finishing step' is common to all three approaches?

?



Optic Nerve Sheath Fenestration

A

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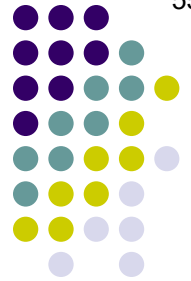
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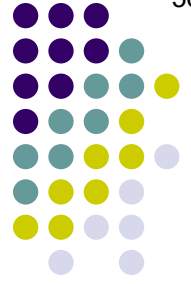
Once the ON is accessed, a small window is cut in its dural sheath. A gush of fluid indicates the subarachnoid space has been opened.

Q

Optic Nerve Sheath Fenestration



What is the mechanism by which ONSF arrests loss of visual function?



A

Optic Nerve Sheath Fenestration

What is the mechanism by which ONSF arrests loss of visual function?

This is controversial. The obvious answer is that the fenestration allows CSF to percolate out of the subarachnoid space, thereby reducing pressure--the brain-equivalent of a trab. (It's not for nothing that IIH has been called 'glaucoma of the brain.')

However, this explanation is problematic, as studies indicate **many fenestrations scar down, thereby precluding long-term CSF egress**. If the fenestration closes, ongoing CSF egress cannot explain the *long-term* effectiveness of ONSF.

That said, the phenomenon of scarring provides an alternative explanation--specifically, that circumferential **scarring prevents CSF from reaching the ONH**, thereby moving the pressure head from the vulnerable circulatory watershed zone that is the ONH to the robustly-perfused retrobulbar region of the nerve. (See the slide-set on *idiopathic intracranial hypertension* for further discussion of this issue.)