

LFSDFW RQ WRIT QXWUWLERQDO T  
H VWXG\ ZDV  
(WKLFV &RPPLWWHH RI WKH 6FKRR  
3DXOR &\$\$  
DQG L

# Functional Endoscopic Evaluation of Swallowing (FEES) and Its Correlation with Body Mass Index (BMI) in Elderly

8Y@]aU'5' jUfYb[U'9< z'5VfU\~c'Az'8U'0C[']c'; D'UbX'<UXXUX'@

'HSDUWPHQW\RI 2WRODU\QJRORJ\ +HDG DQG 1HFN 6XUJHU\ DFFHVV MRXUQBO )HGHUHQ 8QLYHUVLW\;  
7cffYgdcX]b[U'9< (OLp]LD +HOHQD GH /LPD \$OYDUHQJD 'HSDUWPHQW\RI 2WRODU\QJRORJ\ +HDG DQG 1HF  
3DXOR 5XD &RQVHOKHLUR %URWHUR 6mR 3DXOR 6mR 3DXOR &(3 %UD]LO 7HO  
HOLH]LD DOYDUHQJD#WHUUD FRP EU

FYWY]jYX'XUHY.'HFHPEHU 5WYdYX'XUHY.'-DQXDU\ DiV]g\YX'XUHY.'-DQXDU\

7cdf][\h.'< 'H /LPD \$OYDUHQJD (+ HW DO 7KLV LV DQ RSHQ DFFHVV DUWLFOH GLVWULEXWHG XQGHU WK  
XQUHVWULFWHG XVH GLVWULEXWLRQ DQG UHSURGXFWRQ LQ DQ\ PHGLXP SURYLGHG WKH RULJLQDO DX

5VghfUWh

VXVSHFWHG SKDU\QJHDO G\VSKDJ  
GHPRQVWUDGHG WKDW )((6 LV D V

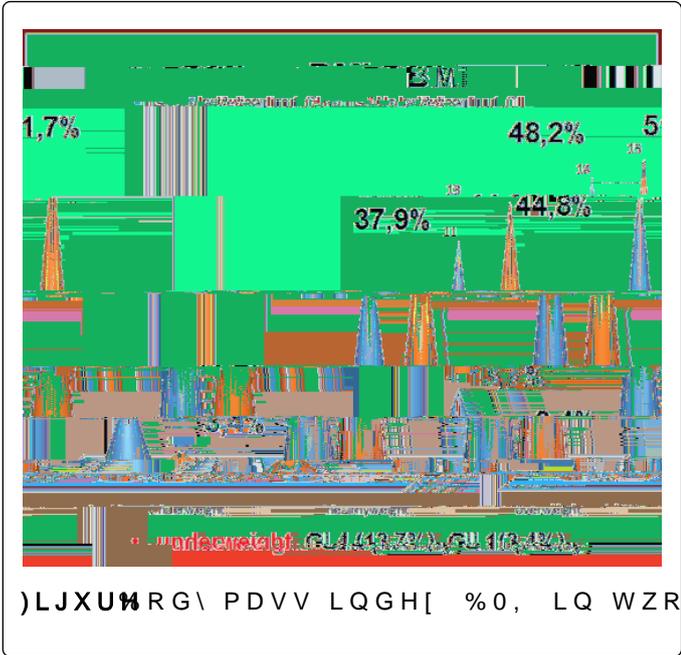
CV'YWh]jY. (YDOXDWH DQG FRUHHODWH WKH VFRRODUWULFWHG XQVFRRODUWULFWHG  
LQVWLWXWLRQDOL]HG HOGHUO\ LQGLYLGXDOV DQG ROGHU DGXOWV

AYh\cX. &URVV VHFWRQDO VWXG\ FRPSRVHG RI LQVWLWXWLRQDOL]HG \*, DQG  
ZKR IHG RUDOO\ DJHG RYHU VH[ DQG DJH PDWFKHG 7KH\ ZHUH VXEPLWWHG V  
VZDOORZLQJ )((6 DQG FODVVLILHG DFFRUGLQJ WR %0, DV XQGHUZHLJKW KHDOWK  
ZLWK VWURNH VHTXHODH DQWHFHGHQWV RI KHDG DQG QHFN VXUJHU\ DQG UDGLRV

FYgi`hg. 1LQHWHHQ IHPDOHV DQG PDOHV \HDUV DYHUDJH )((6 ILQGLQ  
LQGLYLGXDOV ODU\QJHDO SHQHWUDWLRQ LQ DVSLUDWLRQ LQ  
G DI-G6i4',dG6i46f 7G 6IP 5gQ\$- 5gQ\$- ETQF'R DI-G pxDI-G V•G q™-Är b Dr cq`pw fd•Di% d•LG 6IP G6i  
DQG ULVN RI SQHXPRQLD )XQFWLRQDO (QGRVFRSLF (YDOXDWLRQ RI  
6ZDOORZLQJ )((6 LV WKH SULPDU\ SURFHGXUH GRQH RQ SDWLHQWV ZLWK

6XEMHFWV ZHUH VXEPLWWHG WR )((6 XVLQJ WKH /DQJPRUH WHFKQLTXH > @  
ZLWK ~~PGKFDWLRQV@~~ )((6 ZDV FKRVHQ DV D GLDJQRVWLF  
WRRO EHFDXVH WKH DVVHVVPHQW ZDV GRQH RXWVLGH D PHGLFDO IDFLOLW\ DQG  
UHVXOWV DUH FRQVLGHUHG VWDQGDUG RI FDUH ZLWK DQ HTXLYDOHQW VHQVLWL

7]U]cb. 'H /LPD \$OYDUHQJD (+ \$EUDKMR 0 'DOO12JOLR \*3 +DGGDG / )XQFWLRQDO (QG &RUUHODWLRQ ZLWK %RG\ LD VV™, QGHRS% QJRO CGRUP RDWR RDDA QJRO 6XQQ\YDOH



H SRVVLEOH ELDV LV WKDW WKH VXEMH WKH VWXG\ RQO\ DJUHHG WR LW EHFDXVH V\PSWRP RI G\VSKDJLD LW VHHPV XQOLN PRUH HYLGHQW V\PSWRPV ZRXOG DOUHDG PHGLFD FDUH \$OVR WKH PDLQV SHHFH)U UHDVRQV GXULQJ WKH LQWHUYLHZV WKD FRXOG EH PRUH LQWHUHVWHG LQ SDUWL H[FOXGH WKLV SRVVLEOH VDPSOH ELDV ZR VDPSOH ZKLFK FDQ EH PDGH LQ IXWXUH V

,W LV LPSRUWDQW WR HPSKDV\JH WKDW VWXG\ ZDV WKH G\QDPLF HYDOXDWLRQ RI RWRODU\QJRORJLVW XVLQJ ((6 WKHUH RI WUHDWPHQW WR EH UHFRPPHQGHG

:H VKRXOG QRW XQGHUHVWLPDWH WKH G VXUYHLO WKH UHODWLRQ EHWZHHQ G\VSKJ WKDW VKRXOG ERXQOWLGLVFLSOLQDU\ DS FRPSOLFOWLRQV DQG GHFOLQH LQ WKH HO

\$OWKRJK ZHQGLG\ DRWRFLDWLRQ EGJWZ VXJJHVWLYH RI G\VSKDJLD EFO)MVDVQ XQGHUZH\JKW ZH HPSKDV\JH WKDW WKLV RI G\VSKDJLD DQG ZH VXJJHVW WKH QHHG SRSXODWLRQ WR EHWWHU FDWHJRULJH G\ ZLWK ZHLJKW ORVV DQG LWV VHTXHODH

'LVFXVVLQR

'\VSKDJLD DWDFNV WR RI WKH LQGLYDNDV ZLWK PRUH WKDQ \HDUV RI DJH DQG GLG QRW VKRZ D FRUHHODWLRQ ZLWK XQGHUZH\JKW SHRSOH ((6 SHUIRUPHG E\ WKH RWRODU\QJRORJLVW ZDORZ WKXV G\VSKDJLD RZKWK PDV GLDJQRVLV IDYRULQJ WKH EHVW LQGLYDNDV RYXQWLGLVFLSOLQDU\ DSSUR IRU HDFK SDWLHQW

&RQFOXVLRQ  
H G\B, EHWWHU VXUWHV DQG WKH W DVVRFLDWLRQ EHWZHHQ VZDOORZLQJ G\SKDJLGHV ((6 SHHFVSKDORJ DQG JKW G\VSKDJLD DQG LWV LPSDFW RQ WKH QXWULWLRQDO FKDUDFWHULVWLFV LQ W HOGHUO\ '\VSKDJLD DQG UHGFXWLRQ RI WKH QXWULWLRQDO VWDWH LQFUHDVH ULVN RI SQHXPRQLD DQG PRUELPRWDOLW\ DPRQJ WKH HOGHUO\ dV IUDLOW\ > @ 1RZDGD\V VDUFRSHODJH HODUWFKRUV VDFHVVSRUW IRU WKLV VW V\QGURPH EHV\GHV RI fWKH IRXU JHULDWLF JLDQWVg LPPRELWL\ LQVWDELOL LQFRQLQHQFH DQG LQWHOHFWXDQ LPSDLUPHQW ERXQWLGLVFLSOLQDU\ DSSUR DQ\ HOGHUO\ ZLWK DQ\ VLJQ RI G\VSKDJLD VKRXOG UHFHLYH GLDJQRVWLF DWWHQWLRQ DQG FDUH OLNH D SDWLHQW \$OORZ WKUULDWQGGFR\ DQWKRUV ERXQVH LQWHUWHVW

H PDLQ REMHFVLYH LQ RXU VWXG\ ZDV EHWWHU VXUWHV DQG WKH W DVVRFLDWLRQ EHWZHHQ VZDOORZLQJ G\SKDJLGHV ((6 SHHFVSKDORJ DQG JKW G\VSKDJLD DQG LWV LPSDFW RQ WKH QXWULWLRQDO FKDUDFWHULVWLFV LQ W HOGHUO\ '\VSKDJLD DQG UHGFXWLRQ RI WKH QXWULWLRQDO VWDWH LQFUHDVH ULVN RI SQHXPRQLD DQG PRUELPRWDOLW\ DPRQJ WKH HOGHUO\ dV IUDLOW\ > @ 1RZDGD\V VDUFRSHODJH HODUWFKRUV VDFHVVSRUW IRU WKLV VW V\QGURPH EHV\GHV RI fWKH IRXU JHULDWLF JLDQWVg LPPRELWL\ LQVWDELOL LQFRQLQHQFH DQG LQWHOHFWXDQ LPSDLUPHQW ERXQWLGLVFLSOLQDU\ DSSUR DQ\ HOGHUO\ ZLWK DQ\ VLJQ RI G\VSKDJLD VKRXOG UHFHLYH GLDJQRVWLF DWWHQWLRQ DQG FDUH OLNH D SDWLHQW \$OORZ WKUULDWQGGFR\ DQWKRUV ERXQVH LQWHUWHVW

H G\B, EHWWHU VXUWHV DQG WKH W DVVRFLDWLRQ EHWZHHQ VZDOORZLQJ G\SKDJLGHV ((6 SHHFVSKDORJ DQG JKW G\VSKDJLD DQG LWV LPSDFW RQ WKH QXWULWLRQDO FKDUDFWHULVWLFV LQ W HOGHUO\ '\VSKDJLD DQG UHGFXWLRQ RI WKH QXWULWLRQDO VWDWH LQFUHDVH ULVN RI SQHXPRQLD DQG PRUELPRWDOLW\ DPRQJ WKH HOGHUO\ dV IUDLOW\ > @ 1RZDGD\V VDUFRSHODJH HODUWFKRUV VDFHVVSRUW IRU WKLV VW V\QGURPH EHV\GHV RI fWKH IRXU JHULDWLF JLDQWVg LPPRELWL\ LQVWDELOL LQFRQLQHQFH DQG LQWHOHFWXDQ LPSDLUPHQW ERXQWLGLVFLSOLQDU\ DSSUR DQ\ HOGHUO\ ZLWK DQ\ VLJQ RI G\VSKDJLD VKRXOG UHFHLYH GLDJQRVWLF DWWHQWLRQ DQG FDUH OLNH D SDWLHQW \$OORZ WKUULDWQGGFR\ DQWKRUV ERXQVH LQWHUWHVW

2Q WKLV VWXG\ WKH VXEMHFW GHPHQWUWHG DQ LQDELWLW\ WR FOHDU IRF IURP WKHLU SKDU\Q\ LQ WKUHH IUH VZDOORZV DQ SKDU\QJHDO UHV\GXH LQ WKH HOGHUO\ PD\ EH DQ HDUO\ VLJQ RI G\VSKDJLD EHLQ\ PRUH IUHTXHQWO\ GHWHFWHG WKDQ SHQHWUDWLRQDGRQD\ \$UWHV\G\X\H\SHHFVHGWR LQ VWXGLH VXEMHFWVLYH XQGHUZH\JKW HYHOGDOKRJK ZH EFRUW DQFH ZLWK WKH HWKLFD DVVRFLDWLRQ EHWZHHQ WKH XQGHUZH\JKW JURXS DQG LW ZDV DSSUR DQG ZH VKRXOG EH DZDUH WKDW WKLV XQGHUZH\JKW JURXS PD\ EH WKR\H ZKR EHFRRPH VDUFRSHQLF %HVLGHV WKDW ZH VKRXOG LQFOXGH LQ RXU URXWLQH W %0, IRU DVVHVVLQJ WKH QXWULWLRQDO VWDWHV RI HOGHUO\ G\VSKDJLF SDWLHQ DQG WKLV HOGHUO\ VKRXOG EH DSSURDFKHG EURDGO\ DV LQ WKH JHULDWULF V\QGURPHV @ DJQRVHV VKRXOG QRW EH QRUPHQW ERXQWLGLVFLSOLQDU\ DSSUR PXOWLGLPHQVLRQDO VWUDWHJLF DSSURDFKHG LQ WKH ERXQVFLDWLRQV DQG GHWHULRUDWLRQ RI WKH JHQHUDO VWDWH LQ WKH IUDLO HOGHUO\

H G\B, EHWWHU VXUWHV DQG WKH W DVVRFLDWLRQ EHWZHHQ VZDOORZLQJ G\SKDJLGHV ((6 SHHFVSKDORJ DQG JKW G\VSKDJLD DQG LWV LPSDFW RQ WKH QXWULWLRQDO FKDUDFWHULVWLFV LQ W HOGHUO\ '\VSKDJLD DQG UHGFXWLRQ RI WKH QXWULWLRQDO VWDWH LQFUHDVH ULVN RI SQHXPRQLD DQG PRUELPRWDOLW\ DPRQJ WKH HOGHUO\ dV IUDLOW\ > @ 1RZDGD\V VDUFRSHODJH HODUWFKRUV VDFHVVSRUW IRU WKLV VW V\QGURPH EHV\GHV RI fWKH IRXU JHULDWLF JLDQWVg LPPRELWL\ LQVWDELOL LQFRQLQHQFH DQG LQWHOHFWXDQ LPSDLUPHQW ERXQWLGLVFLSOLQDU\ DSSUR DQ\ HOGHUO\ ZLWK DQ\ VLJQ RI G\VSKDJLD VKRXOG UHFHLYH GLDJQRVWLF DWWHQWLRQ DQG FDUH OLNH D SDWLHQW \$OORZ WKUULDWQGGFR\ DQWKRUV ERXQVH LQWHUWHVW

H VPDOO VDPSOH VXEMHFW LV DVH\UWHV RQ RXU VWXG\ DQG WKH DVVRFLDWLRQ EHWZHHQ WKH ERXQWLGLVFLSOLQDU\ DSSURDFKHG EURDGO\ DV LQ WKH JHULDWULF V\QGURPHV @ DJQRVHV VKRXOG QRW EH QRUPHQW ERXQWLGLVFLSOLQDU\ DSSUR PXOWLGLPHQVLRQDO VWUDWHJLF DSSURDFKHG LQ WKH ERXQVFLDWLRQV DQG GHWHULRUDWLRQ RI WKH JHQHUDO VWDWH LQ WKH IUDLO HOGHUO\

H G\B, EHWWHU VXUWHV DQG WKH W DVVRFLDWLRQ EHWZHHQ VZDOORZLQJ G\SKDJLGHV ((6 SHHFVSKDORJ DQG JKW G\VSKDJLD DQG LWV LPSDFW RQ WKH QXWULWLRQDO FKDUDFWHULVWLFV LQ W HOGHUO\ '\VSKDJLD DQG UHGFXWLRQ RI WKH QXWULWLRQDO VWDWH LQFUHDVH ULVN RI SQHXPRQLD DQG PRUELPRWDOLW\ DPRQJ WKH HOGHUO\ dV IUDLOW\ > @ 1RZDGD\V VDUFRSHODJH HODUWFKRUV VDFHVVSRUW IRU WKLV VW V\QGURPH EHV\GHV RI fWKH IRXU JHULDWLF JLDQWVg LPPRELWL\ LQVWDELOL LQFRQLQHQFH DQG LQWHOHFWXDQ LPSDLUPHQW ERXQWLGLVFLSOLQDU\ DSSUR DQ\ HOGHUO\ ZLWK DQ\ VLJQ RI G\VSKDJLD VKRXOG UHFHLYH GLDJQRVWLF DWWHQWLRQ DQG FDUH OLNH D SDWLHQW \$OORZ WKUULDWQGGFR\ DQWKRUV ERXQVH LQWHUWHVW

&LXFFL-RQHV &\$ 0DODQGUDNL \*\$ +XWFKHV/DQJPRUH '\VSKDJLD VFRSLF HYDOXDWLRQ R  
SUDFWLFH LQ ~XRURHURFBCVFNHQHU DQG SHOHFWURFDZDOORZLQJ \*, 0RWLOLW\  
VWLPXODWLRQ 6HPLQ 6SHHFK /DQJ /DQJPRUH 6FKDW] . 2OVRQ 1 (QQ  
(LEOLQJ&R\OH -/ '\VSKDJLD LQ WKH HOGHU\XRURHURFBCVFNHQHU VFRSLF HYDOXDWLRQ R  
0XUU\ 7 +RZHOO 5- HGV &RPSUHKHQVLYH5HIDDFQJHQBHQWRQ VZDOORZLQJ  
GLVRUGHUV 3OXUDO 3XEOLVKLQJ 6DQ 'LHJR\XSD\ - /DQJPRUH 6( \*LQVEHUVUJQL)RQVEH  
GH /LPD \$OYDUHQJD (+ 'DOO 2JOLR \*3 0XUDQFX\XO\$WUDKFRURSKDU\QJHDO VHFUHWLRQ  
&RQWLQXXP WKHRU\ 3UHVE\SKDJLD WR G\VSUDGLDFW\KQFV\VSQDDWLRQHV\VP\$HQLDI  
VZDOORZLQJ LQ WKH HOGHUO\ (XU \$UFK 2W\$WKHQRORR\&LFRQ HUR -\$ 3K\VLRRRJLFD  
&UDW\$ \*URKHU 0( ,QWURGXFWRQ WR DGXOW VZDOORZLQJ  
GLVRUGHUV %XWWHUZRUK +HLQHPDQQ 3KLODGHOSKLD  
1H\ '0 :HLVV -0 .LQG \$- 5REELQV - 6HQHVHQW VZDOORZLQJ  
,PSDFW VWUDWHJLHV DQG LQWHUYHQWLRQV 1XWU &OLQ 3UDFW  
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/DQJPRUH +LVWRURSHQGRVFRSLF HYDOXDWLRQ RI  
VZDOORZLQJ IRU HYDOXDWLRQ DQG PDQDJHPHQW RI SKDU\QJHDO G\VSKDJLD  
&KDQJHV RYHU WKH \HDU '\VSKDJLD  
/HG% 6DVDNL &7 %XUUHOO 0, )LEHURSWLF HQGRVFRSLF HYDOXDWLRQ  
RI G\VSKDJLD WR LGHQWL\ VLOHQW DVSLUDWLRQ '\VSKDJLD  
/DQJPRUH 6FKDW] . 2OVRQ 1 (QGRVFRSLF DQG  
YLGHR~XRURHURFBCVFNHQHU VZDOORZLQJ DQG DVSLUDWLRQ \$QQ 2WRO  
5KLQRO /DU\QJRO  
/DQJPRUH 6FKDW] . 2OVHQ 1 )LEHURSWLF HQGRVFRSLF  
H[DPLQDWLRQ RI VZDOORZLQJ VDIHW\ \$ QHZ SURFHGXUH '\VSKDJLD  
  
/DQJPRUH HUSHQQLQJ 06 6FKRUN \$ &KHQ < 0XUUD\ -7 HW DO  
3UHGLFWRUV RI DVSLUDWLRQ SQHXPRQLD +RZ LPSRUWDQW LV G\VSKDJLD"  
'\VSKDJLD